

Electric Leagues To Discuss Price Laws

(Concluded from Page 1, Column 2)

Opening address of the conference will be presented by Horace P. Liversidge, president of Philadelphia Electric Co., and the balance of the first day's open meeting will consist of a review of the industry's principal cooperative promotional activities by their national leaders.

"Fair Trade Agreements and Practices" and other subjects of interest to League members will be discussed by leading authorities. Program committee appointed by President George R. Conover met recently to complete conference details.

Ample discussion times will be allowed following each of the addresses on the open programs, it was announced.

Friday afternoon and Saturday sessions of the conference will be for League members only, and will be devoted to informal discussions of League manager's problems. Election of officers for 1939 and other business details are set for Friday afternoon, Nov. 18.

Representatives of utilities, manufacturers, wholesalers, contractors, and dealers, and others interested in local cooperative promotion, are invited to attend the conference's open meetings.

'Monopoly' Group Assumes WPA 'Price Laws' Study

WASHINGTON, D. C.—Study of the effect of price maintenance legislation (better known as "fair trade laws") has been divorced from the Works Progress Administration, where the survey was started several months ago, and will be continued more thoroughly, it is understood, under the wing of the Temporary National Economic Committee set up by Congress to study monopoly in business.

The WPA project will be continued merely as a compilation of the laws themselves, the more important work involving interstate commerce, retail prices, anti-trust laws, and FTC rulings to be handled by the Congressional committee, probably with the aid of the Federal Trade Commission and the Department of Justice.

Many of the government's legal and economic experts, for instance, are convinced that the Tydings-Miller or "fair trade" act conflicts with certain important provisions of the Sherman and Clayton anti-trust statutes. Yet the act is constitutional in the view of those who believe in broadening federal control even to intrastate commerce.

Due to the growing opposition to measures of this sort, it seemingly is becoming increasing possible that the Tydings-Miller act, which was passed over administration opposition only as a rider to the District of Columbia revenue bill, may be repealed by the next Congress, perhaps with the support of administration influence.

Fire Department Gets Air-Cooled Ambulance

SPARROWS POINT, Md.—Maryland's first "air-conditioned" ambulance has just been placed in service by the Sparrows Point Volunteer Fire Department.

The system, located beneath the floor of the patient's compartment, uses a fan to distribute air which is cooled by water circulating through cracked ice. One loading of ice, it is claimed, will last 24 hours.

You Can Install
SPORLAN
THERMOSTATIC
EXPANSION VALVES
with Confidence!

BUNDY TUBING
Copper-Brazed Steel. Copper Coated Inside and Out. Sizes: 1/8" to 1/2" O.D.
BUNDY TUBING CO., DETROIT

Directs Sales



H. M. BUTZLAFF
Whose appointment as sales manager of the household refrigeration department of Westinghouse was announced last week by R. C. Cosgrove, manager of the department.

2 Full Days Program Planned at Knoxville Foods Conclave

(Concluded from Page 1, Column 5)

and a number of university staff members will present papers. Program is modeled largely after the successful food conference held last June at State College, Pa., in connection with the ASRE's annual meeting there. In addition to technical sessions, movies on refrigerated locker plants and frozen foods will be presented on the night of Oct. 20, and an inspection trip through Fulton Sylphon Co.'s plant is scheduled for the following afternoon, to be followed by a dinner at which Dr. L. V. Burton, editor of Food Industries, will be speaker.

Trip to Norris Dam, 27 miles from Knoxville, will be arranged for those who want to stay over the day after the conference closes.

First session of the conference will be chaired by R. W. Morton of Tennessee's college of engineering and will open with an address of welcome by Dean Ferris.

"Refrigeration—A Vital Factor in the Food Industry," will be the topic of a paper by D. L. Fiske, national secretary of ASRE, after which "Refrigeration—A Boon to Farmers," will be discussed by C. J. Hurd of the agricultural engineering division of TVA, Knoxville.

Luncheon in the university cafeteria will be followed by an address by Dr. F. B. Ward of the university's department of economics.

Chester Lichtenberg of General Electric Co., Fort Wayne, Ind., will chair the afternoon sessions, discussions at which include "Bacteria—The Friends and Foes of the Food Industry," by Dr. P. W. Allen, professor of bacteriology at Tennessee; "Behavior of Enzymes," by a chemist of the university agricultural experiment station; "Effects of Freezing on the Vitamin Content of Vegetables," by Gerald Fitzgerald, chief chemist of Birdseye Laboratories, Boston; and "Control of Molds and Bacteria with Light," by Dr. Harvey Rentschler, Westinghouse Lamp division, Bloomfield, N. J.

Night program also will include an illustrated lecture on "Refrigerated Locker Plants" by A. A. Geiger of York Ice Machinery Corp.

Morning session on Oct. 21 will have as chairman Dean W. R. Woolrich of the University of Texas' college of engineering, and will include talks on "Quick Freezing Fruits and Berries," by R. B. Taylor of the Tennessee engineering experiment station; "Ice Crystal Forming in Frozen Foods," by R. M. Bergstein, Interstate Folding Box Co., Middletown, Ohio; and "Some Commercial Aspects of the Frozen Food Industry," by Harry Carlton, market investigator of the Tennessee agricultural experiment station.

Afternoon session will be under the chairmanship of Prof. C. E. Wylie, and will include papers on "Economics of Farmers' Locker Plants," by W. E. Guest, Chicago consulting engineer; and "What Is Ahead for the Frozen Food Industry in the Southeast," by C. T. Baker, Atlanta consulting engineer.

Inspection trip through the Fulton Sylphon plant and an informal dinner with Dr. Burton as speaker will close the conference.

Kelvinator Takes Over N. Y. Distribution

NEW YORK CITY—E. A. Wildermuth, for the past five years distributor of Kelvinator household refrigerators in metropolitan New York, has discontinued handling the line as of Oct. 1, and distribution has been taken over by Kelvinator's factory branch in Long Island City, it was announced last week.

Kelvinator is consolidating its domestic division here with the Long Island City branch, where in the past the commercial division only has been located, to handle distribution of all refrigeration products, according to the announcement.

Both divisions will be under the direction of Keith L. Saunders, who has just been named zone manager. For the past two years, Mr. Saunders has been eastern regional manager for the company.

Mr. Saunders has taken over the entire Kelvinator personnel from the Wildermuth organization, including Ray Hoefler, who becomes household sales manager in charge of the dealer division.

Mr. Wildermuth's withdrawal from the local Kelvinator distributorship was entirely voluntary, it was emphasized. Other than that he "had been contemplating a change," no reason was given by Mr. Wildermuth for discontinuing Kelvinator distribution.

He said that he would continue in the distributor field, but that announcement of the new lines he would carry would not be made for about a week.

Carrier Debenture Plan Is Filed With SEC

(Concluded from Page 1, Column 5)

tion statement are Hemphill, Noyes & Co. and Stern, Wampler & Co., Inc. As reported to the SEC, the company sells not only equipment but also the services of a specialized engineering organization in connection with the design, fabrication, and installation of air-conditioning systems. In addition to the sale of complete systems, the company manufactures for sale individually or in combinations the necessary equipment for refrigeration, heating, air handling, humidification control, and other purposes relating to air conditioning and to industrial and commercial refrigeration.

G-E Orders In 3rd Quarter Down 31% From 1937

SCHENECTADY, N. Y.—Orders received by General Electric Co. during the third quarter of 1938 amounted to \$60,533,135, compared with \$88,010,937 during the same quarter last year, a decrease of 31%, reports President Gerard Swope.

Orders received in the first and second quarters decreased 38% and 44% respectively, from the corresponding periods last year.

For the first nine months this year orders received amounted to \$188,756,958, a decrease of 38% from the \$305,276,556 received during the same period a year ago.

FTC Charges Brunswick With Unfair Practices

WASHINGTON, D. C.—Federal Trade Commission has charged Brunswick-Balke-Collender Co., Chicago manufacturer of bowling equipment and commercial refrigerators, with having engaged in unfair competitive practices harmful to the bowling industry in connection with the B-B-C Red Crown Bowling Sweepstakes.

It is understood, however, that the company will not only deny the "unfair competition" accusations, but also will introduce a number of experts to testify that the Red Crown contest has brought unparalleled prosperity to the bowling trade.

In its charges, the FTC claims that Brunswick-Balke-Collender's practices tend to give it a monopoly in the manufacture and sale of bowling equipment, and further asserts that the company conducted the bowling contest for the purpose of coercing bowling alley proprietors into buying equipment exclusively from the B-B-C organization.

Specifically, the commission alleges that Brunswick-Balke-Collender threatened to open alleys in competition with those which failed to qualify for the tournament (which necessitated purchase of a considerable amount of B-B-C equipment); that it increased the price of its equipment to cover at least part of the prize money offered in the tournament; and that it failed to make qualifying terms identical to all.

These acts, the commission claims, violate Section 3 of the Clayton act.

Refrigerated APPLE STORAGE with A-P Valves

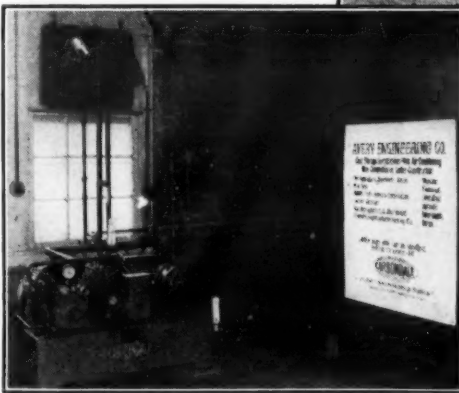
Successful Apple Storage demands constant temperatures, and the most accurate of Control Equipment. Too great a fluctuation means loss of quality and appearance. So, for Apple Storage, as well as for all types of Refrigeration and Air Conditioning, A-P Valves are safest.

Supersensitivity to minute temperature differences — plus easy installation, easy adjustment, and leakproof, service-free efficiency—places A-P Thermostatic Expansion Valves in No. 1 choice with the Installing Engineer, Service Engineer — and your customer, the user.

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MILWAUKEE WISCONSIN

Export Department
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● REFRIGERATION PARTS JOBBERS WHO RECOGNIZE QUALITY... STOCK CONTROLS



Installations . . .
Modern Apple Storage Plants
Refrigeration Unit . . .
Carbondale
Sold and Installed by . . .
Avery Engineering Company
Cleveland, Ohio
Valves . . .
Purchased Through . . .
The Harry Alter Co.



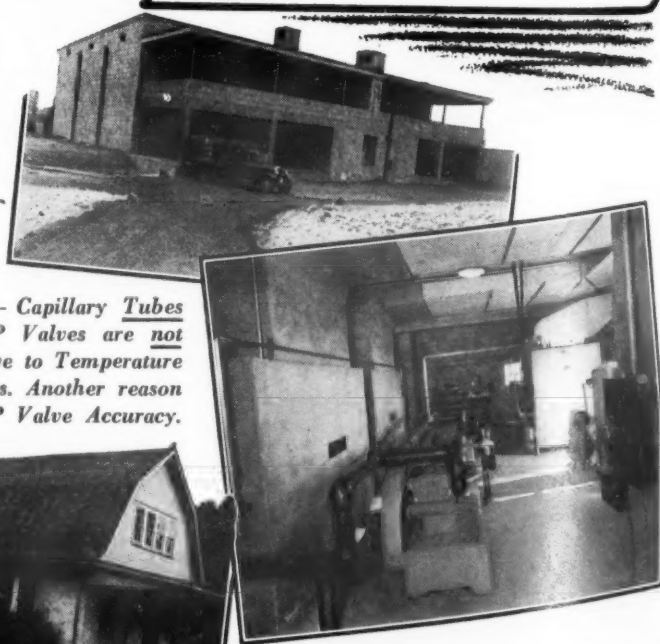
DEPENDABLE
THE BYWORD FOR A-P VALVES

AIR CONDITIONING AND REFRIGERATION
EVERY ENGINEERING COMPANY
214 CANNON AVENUE
CLEVELAND
April 26, 1938.

Automatic Products Company,
Union Building
Cleveland, Ohio
Gentlemen: Attention: Mr. Anderson

The picture we furnished you showed a few of our jobs on which we have used Automatic Products valves. We have had good service from these valves and good service from your office and trust that we can continue to do business on a mutually satisfactory basis.

Very truly yours,
EVERY ENGINEERING COMPANY
By *Lt. J. C. Long*
President
LTA:LE



The 500th Issue 20,000 COPIES 40 PAGES

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The Newspaper of the Industry

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INDUSTRY MOBILIZING FOR MARKET EXPANSION WITH GRAND PREVIEW OF 1939 PRODUCTS & ACCESSORIES

THE COLD CANVASS

By B. T. Umore

The First 500 Are The Hardest—We Hope

Five hundred issues of the NEWS have, during the past 12 years, laid Old B.T.U. endways more than once. During the process of turning out those 500 editions the industry has grown big and the publisher has turned gray.

The editor is getting bald, and his Hollywood flame has married another fellow (Thanks for the Memory). The romance of the business manager and the subscription manager blossomed and bore fruit. They now have a son who is going to play left end for Illinois in 1958.

The advertising manager has a boy who is 6 feet tall, and who has won a flock of medals down at Culver; while the assistant advertising manager has just returned from his honeymoon.

Beautiful stenographers by the dozen have quit to get married. That stunning redhead who used to make the visiting firemen forget what they came for now has twins. Nor is the current crop neglected, judging by the line-up of honking automobiles out front at 5 o'clock every evening.

Started in three dingy little rooms on Jefferson Ave., the NEWS now has its own spacious air-conditioned home in the Art Center district.

Thirteen million household refrigerators have been sold, and 934 concerns are now listed in the Directory. Practically all the successful companies have advertised in the NEWS.

(Concluded on Page 4, Column 4)

Gas Industry to Court Specialty Dealers as Prime Sales Outlet

ATLANTIC CITY, N. J.—Much of the future success of the gas appliance industry depends upon the extent to which it is able to merchandise its products through department and furniture stores and specialty appliance dealers, Merrill N. Davis, president of the Association of Gas Appliance and Equipment Manufacturers, told the twentieth annual American Gas Association convention in Hotel Claridge here last week.

Manufacturers of "Certified Performance" gas appliances are urged to make a start by making a list of the dealers in their territory who are qualified to handle their products.

Detroit Maps Code For Refrigeration Operators

DETROIT—With the revised code covering the installation and use of refrigeration systems near acceptance, H. H. Mills of the Department of Building and Safety Engineering, City of Detroit, has recently prepared a proposed ordinance to cover the operation and maintenance of refrigeration systems.

According to Mr. Mills, it is necessary that a start be made on drafting a suitable ordinance governing the operation of refrigeration equipment. The foregoing ordinance is only tentative, and interested agencies will be given an opportunity to lend their aid.

(Concluded on Page 27, Column 1)

Banquet Speakers



HENRY W. BURRITT
Vice President in Charge of Sales,
Nash-Kelvinator Corp.



L. R. BOULWARE
General Manager, Carrier Corp.

Suit Against Tafel Co. Is Withdrawn

CINCINNATI—Suit recently instituted against Tafel Electric & Supply Co. by Kelley-Mason, Inc., its successor as Westinghouse distributor in the Cincinnati territory, was withdrawn Oct. 11, reports Paul Tafel, general manager of the Tafel organization.

The Tafel company, with headquarters in Louisville, Ky., formerly operated Tafel Refrigeration Co. here, and relinquished its Ohio territory to Kelley-Mason on April 29 of this year. However, the company retained Westinghouse distribution in its Kentucky and Tennessee territory.

The suit sought judgment of \$5,003, of which \$2,992 represented a service reserve to which Kelley-Mason claimed it became entitled when it took over distribution in the Cincinnati territory. A second judgment of \$2,011 was sought for an alleged infringement by Tafel of Kelley-Mason territory in selling refrigerators to a Cincinnati dealer on June 12, after the distributorship had changed hands.

Refrigeration Supplies & Parts Manufacturers Association Sponsors First All-Industry Exhibition and Banquet

Big Show Will Open at Stevens Hotel, in Chicago, Monday, Jan. 16, 1939

Schedule of Events

Opening Day, Monday, Jan. 16
Preview of Exhibition by Jobbers—10 A.M.
Formal Opening of Exhibition to the Trade—2 P.M.
All Industry Banquet—7 P.M.

Organization Meeting of Proposed Air Conditioning
Dealers and Contractors Association.

Annual Convention of Refrigeration Supplies & Parts
Manufacturers Association.

Convention of Refrigeration Supply Jobbers Association.

Meeting of Mid-Western Sections of American Society
of Refrigerating Engineers.

Contractors & Dealers Plan To Organize

DETROIT—In response to numerous suggestions, a meeting of air-conditioning contractors and dealers is being planned for the week of the All Industry Refrigeration and Air Conditioning Exhibition, at the Stevens hotel, Chicago.

Purpose of the meeting will be to discuss the organization of a national association of independent contractors and dealers who have a financial stake in the industry.

Among the problems for consideration at the Chicago meeting will be matters of vital interest to the heads of organizations engaged in the air-conditioning trade, such as:

Costs—Many experienced men in the air-conditioning industry feel that better and more uniform methods of obtaining costs are necessary before a definite improvement can be made in the average price structure.

Mark-up—Opinions will be sought as to the relative merits of various methods used to mark-up air-conditioning contracts from the costs.

Field engineering expense—Because of the fact that engineering and estimating expense has been found to be out of proportion to other costs in many localities, these factors will be discussed.

Sales methods and costs—Of prime importance to the air-conditioning contractor and dealer are sales methods used in the industry. Industry

(Concluded on Page 4, Column 2)

Special Show Preview Planned For Jobbers

CHICAGO—Members of National Refrigeration Supply Jobbers Association will have every opportunity to meet with manufacturers for discussions of mutual problems during their fourth annual convention, scheduled for the Stevens hotel Jan. 16 to 18, during the All-Industry Refrigeration and Air Conditioning Exhibition.

According to tentative plans for the jobbers' meeting, a special "Jobbers' Preview" of the All-Industry Exhibition will be held from 10 a.m. to 2 p.m. on Jan. 16, first day of the show. This will give all jobbers an opportunity to inspect exhibits,

(Concluded on Page 2, Column 4)

Attwood Named M & E Sales Manager

PHILADELPHIA — Eli Attwood has been appointed refrigeration sales manager of Merchant & Evans Co. to succeed F. E. Wilson, who has resigned to accept a position with another company, announces Thomas Evans, president.

Mr. Attwood has had 15 years' experience in refrigeration sales work, as well as in the adaptation and application of electric refrigeration in all types of commercial and air-conditioning engineering and installations.

Central Refrigerator Rebuilding Service Set Up To Ease Philadelphia Trade-In Problem

PHILADELPHIA — A centralized service for reconditioning and guaranteeing used electric refrigerators is now being offered to Philadelphia appliance dealers in connection with efforts of the Electrical Association of Philadelphia to stimulate trade-in business through use of a definite trade-in allowance schedule.

To handle used and trade-in household refrigerators taken in by dealers under the plan, a large refrigeration reconditioning plant, known as Associated Refrigerator Plant, Inc., has been opened at 3028 W. Hunting Park Ave., reports

Andrew J. Asch, Jr., who is connected with the organization.

Under its agreement with distributors and dealers, the plant will undertake to recondition and refinish refrigerators which are "reasonably complete and operative," and warrant such refrigerators for 90 days from the period of their "start up" in the homes of original purchasers.

The service is thought to be unique, says Mr. Asch, in that it also incorporates a "junking service" for dealers on used units which are unfit for reconditioning and resale.

(Concluded on Page 38, Column 3)

CHICAGO—Previewing the future in commercial refrigeration, and promoting the replacement market for household refrigerators, the First All-Industry Exhibition is already an assured success.

Officials of the Refrigeration Supplies & Parts Association, which is sponsoring the exhibition, announce that all but a small portion of the exhibit space has now been taken, and that hundreds of their customers have signified their intention of attending. The exhibition will be held in the Stevens hotel, Chicago, from Jan. 16 to 19.

Manufacturers are preparing their most advanced products for display at this exhibition, including designs which may not be ready for production at that time.

TO VISUALIZE NEW MARKETS FOR DEALERS & SERVICE MEN

The big idea is to help jobbers, dealers, and service men visualize their future markets, in addition to acquainting them with every conceivable kind of refrigeration and air-conditioning product now available.

During the last year or so a whole flock of new uses for commercial refrigeration have been developed. Still others are in the "approach" stage. All such new applications will be demonstrated, discussed, and planned for at the exhibition and at some of the group meetings which will be held in conjunction (see "Schedule of Meetings" on this page).

As for the replacement market, manufacturers will show how their products may be utilized, not only to service refrigerators now in use, but to rebuild for low-income prospects the refrigerators which are traded in on new ones.

MILLIONS OF UNITS REACHING AGE OF OBSOLESCENCE

There are now approximately one million household electric refrigerators in use which are more than 10 years old. During the next five years there will be approximately four million household electric refrigerators reaching the age of obsolescence.

(Concluded on Page 4, Column 1)

RMA Votes Approval Of Standards For Ammonia Units

MONTREAL, Que., Canada — Standards covering a wide range of ammonia equipment were approved by members of Refrigerating Machinery Association at their annual meeting in the Mount Royal hotel here Oct. 11. This marks the completion of the first stage of a broad standardization program embarked upon by the organization more than a year ago.

It is now planned to extend the association's standardization studies to include Freon equipment. Standards approved at last week's meeting will be released in published form within the next month, it was announced.

W. S. Shipley, president of York Ice Machinery Corp., was elected president of the association, and J. C. ...

(Concluded on Page 38, Column 1)

Committees Representing Jobbers and Parts Manufacturers Meet to Coordinate Plans for January Conventions and Exhibition



SERVEL congratulates the News on its 500th milestone of consistent journalistic service to the industry

LOOKING BACK

SERVEL is gratified to know that its customers have been satisfied with their purchases. We quote briefly from a few of the hundreds of friendly comments we have received:

From a USER who has bought Servel machines for seventeen meat markets over a period of 8 years—

"... we have been more than pleased with the performance that Servel refrigeration has given us ... in 8 years, we have had occasion to call your engineers only once to straighten out a minor trouble."

From a DISTRIBUTOR who has sold Servel commercial refrigeration for over 6 years—

"... it is most gratifying to handle a line of machines in which the inherent quality of material and workmanship is so apparent ... our relations with your company have been most pleasant and satisfactory, and your every co-operation has been appreciated."

From a MANUFACTURER who has used Servel commercial refrigerating machines exclusively for over 6 years—

"... our experience with your products has been extremely favorable ... to the best of my knowledge, we have yet to receive our first complaint on your equipment traceable to poor quality or poor workmanship."

LOOKING FORWARD

SERVEL gladly accepts the responsibility for maintaining the good name that its products and policies have established.

WE PLEDGE—a line of commercial refrigeration and air conditioning machines that will set the pace in 1939 for performance, flexibility and sales appeal.

WE PLEDGE—sizes and types to fit every purse and purpose.

WE PLEDGE—our continued co-operation in engineering, sales and service that has been so important in guiding our customers in the past.

Plan now for 1939. Start now by laying your machine problem in our lap. We'll help you solve it.

SERVEL, Inc.

Electric Refrigeration and Air Conditioning Division

Evansville, Indiana

Jobbers: (1) H. W. Blythe, H. W. Blythe Co., Chicago; (2) Leo H. Gorton, Machine Tool & Supply Co., Tulsa, Okla.; (3) H. W. Merkel, Merkel Bros. Co., Cincinnati, Ohio (president of the Refrigeration Supply Jobbers Association). (4) See note.

Manufacturers: (5) M. W. Knight, Peerless of America, Inc., Chicago (chairman of Exhibition Committee); (6) W. A. Leonard, Imperial Brass Mfg. Co., Chicago; (7) K. B. Thorndike, Detroit Lubricator Co., Chicago (chairman of the Publicity Committee); (8) Charles W. Johnston, Virginia Smelting Co., W. Norfolk, Va.

Note: Irving Alter, Harry Alter Co., Chicago, should be in position (4) but he was busy taking these excellent candid camera shots including this one of F. M. Cockrell, publisher of the NEWS. Mr. Cockrell also took pictures of the group but his photography did not turn out so good.

Jobbers Make Plans For Convention In Chicago During All-Industry Exhibition

(Concluded from Page 1, Column 4) and to make appointments with the manufacturers they want to see while in Chicago.

Admission to the Exhibition Hall will be limited to jobbers up to 2 p.m., at which time the doors will be opened to all other members of the refrigeration and air-conditioning industry.

Directors of the jobbers' group will hold their meeting on Sunday, Jan. 15, according to present plans, paving the way for the opening session of the general convention, which will be called to order by President Henry W. Merkel at 2:30 p.m. on Jan. 16.

Opening session will adjourn in ample time for jobbers to attend the week's biggest event—the All-Industry Banquet—at which speakers of national prominence will be heard.

Another association session, open to all jobbers, will follow on the morning of Jan. 17, and a joint manufacturers' and jobbers' luncheon will be held at noon. At this meeting, an effort will be made to have every jobber meet and become acquainted with every manufacturer and manufacturer's representative present, giving the jobber a second chance to check his list of business appointments.

Afternoon of the second day of the meeting will be left open for attending the exhibition or for conferences with manufacturers or with jobber committees.

Another new event is planned for the evening of Jan. 17. The newly organized West Coast Jobbers Association is holding a membership meeting in Chicago at that time; and it is proposed, members of other sections being willing, to organize four or five similar meetings of jobbers from other sections, with all gatherings being held simultaneously. "Get acquainted with your neighbors—you may find them pretty fine fellows," is the theme of the evening's activity.

Annual business meeting of the

association and election of officers for 1939 will be held on the morning of Jan. 18, with the convention officially ending at noon on that day with a farewell luncheon at which the newly named directors and officers will be introduced. This luncheon will be for jobbers only.

This will end the regular convention proceedings, but it is expected that several of the important committees will have a full day's schedule of matters to be attended to on Thursday, Jan. 19, closing day of the exhibition.

Directors of the jobber group are asking all members to assist them in selecting the convention committees which will have the responsibility of outlining the program and events in detail, and of seeing that the arrangements are executed properly. Members also are requested to suggest subjects which they would especially like to have presented at the meeting. Questionnaire has already been sent to all members, and directors will make all future plans in accordance with desires expressed in the replies received.

Indications are that the coming convention will bring together the largest number of refrigeration supply jobbers ever assembled at any one time, association heads say.

Present officers of the jobbers' association are: president, Henry W. Merkel of Merkel Bros. Co., Cincinnati; Leo H. Gorton of Machine Tool & Supply Co., Tulsa, Okla., vice president; and the following directors: F. A. M. Dawson, Refrigeration Supplies Co., London, Ont., Canada; D. L. Lingo of D. C. Lingo Co., Houston, Tex.; Clarence F. (Sandy) Pratt, California Refrigerator Co., San Francisco; H. S. McCloud, Williams & Co., Pittsburgh; Arnold Dessau of Melchior, Armstrong, Dessau Co., New York City; Irving Alter, the Harry Alter Co., Chicago; F. H. Langsenkamp, Jr., of F. H. Langsenkamp Co., Indianapolis; Robert H. Spangler, the Spangler Co., St. Louis.

A PEERLESS Product Is An Ambassador of Good Will

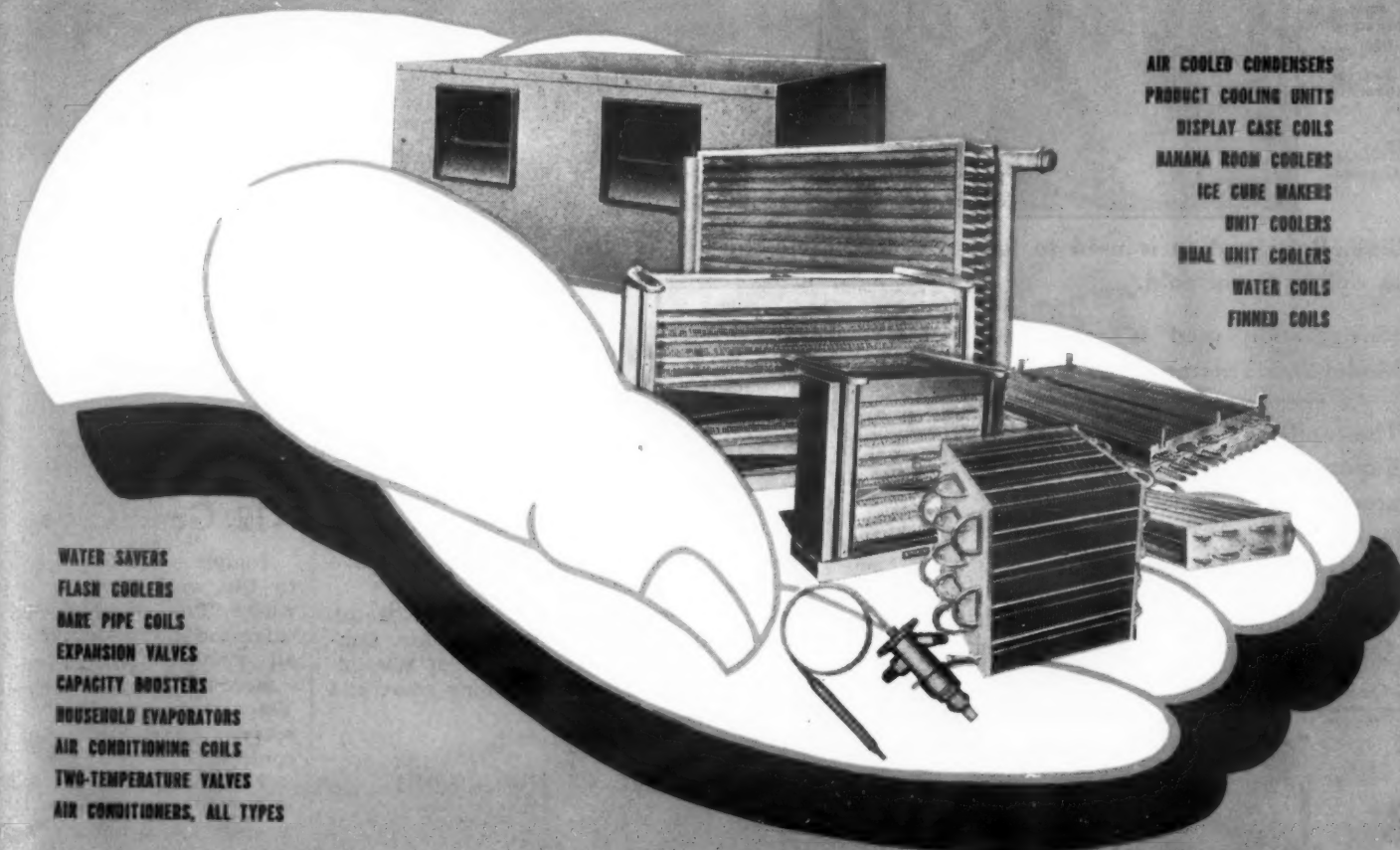
● Your most priceless asset is the good will of those you serve. You grow stronger in influence and wealth in direct proportion to the scope and the degree of friendly relationship that exists between you and those who buy your goods. And it is axiomatic that a business that waxes strong is ever anxious to give its trade the benefits of better value, because better value builds a wall against destructive competition.

He who incorporates a Peerless product in an air conditioning or refrigeration installation, does so in the firm belief that he is giving his customer the greatest possible value for his money. No one can deny the higher efficiency of the Peerless "rifled," finned coil, tailor-made to your specifications . . . the Peerless unit cooler . . . the velvet action of the Peerless thermal expansion valve.

Competitive in price, and with an ever widening endorsement by jobbers, contractors and servicemen, Peerless products lead in the establishment of friendly, profitable relationships.

Write for Catalogs describing the complete line of Peerless products for air conditioning and refrigeration

Peerless Products Will Be Shown in the First All-Industry Exhibition, Stevens Hotel, Chicago, January 16, 17, 18 and 19



WATER SAVERS
FLASH COOLERS
BARE PIPE COILS
EXPANSION VALVES
CAPACITY BOOSTERS
HOUSEHOLD EVAPORATORS
AIR CONDITIONING COILS
TWO-TEMPERATURE VALVES
AIR CONDITIONERS, ALL TYPES

AIR COOLED CONDENSERS
PRODUCT COOLING UNITS
DISPLAY CASE COILS
KITCHEN ROOM COOLERS
ICE CUBE MAKERS
UNIT COOLERS
DUAL UNIT COOLERS
WATER COILS
FINNED COILS

COAST TO COAST Peerless Products Stocked and Sold by These Leading Jobbers

Akron, O. Percy G. Hansen
Albany, N. Y. Melchior, Armstrong, Dessau Co.
Atlanta, Ga. Bowen Refrig. Supplies Co.
Baltimore, Md. Melchior, Armstrong, Dessau Co.
Beaumont, Tex. Standard Brass & Mfg. Co.
Birmingham, Ala. Refrigeration Supplies Dist.
Boston, Mass. A. E. Borden Co.
Brooklyn, N. Y. Melchior, Armstrong, Dessau Co.
Buffalo, N. Y. Melchior, Armstrong, Dessau Co.
Cambridge, Mass. Melchior, Armstrong, Dessau Co.
Charlotte, N. C. Henry V. Dick & Co.
Chattanooga, Tenn. Peglar Machinery Co.
Chicago, Ill. Airo Supply Co.
Chicago, Ill. Automatic Htg. & Cooling Supply Co.
Chicago, Ill. H. W. Blythe Co.
Chicago, Ill. Borg-Warner Corp.
Chicago, Ill. Chase Refrig. Supply Co.
Cincinnati, Ohio The Merkel Bros. Co.
Columbus, Ohio Pixley Electric Supply Co.
Dallas, Tex. The Electromotive Corp.
Dallas, Tex. Refrigeration Supply Co.
Davenport, Ia. Republic Electric Co.
Dayton, O. W. H. Kiefhaber Co.
Denver, Col. Refrigerator Parts & Supply Co.
Des Moines, Ia. Dennis Refrigeration Supply
Detroit, Mich. J. M. Ober, Inc.
Evansville, Ind. Evansville Supply Co.
Fort Wayne, Ind. H. J. Schroeder Co.
Harrisburg, Pa. Melchior, Armstrong, Dessau Co.
Hartford, Conn. Maraden & Wasserman
Houston, Tex. Standard Brass & Mfg. Co.
Indianapolis, Ind. Central Supply Co.
Kansas City, Mo. Forslund Pump & Mach'y Co.
Los Angeles, Cal. Commercial Refrig. Supply Co.
Los Angeles, Cal. Pacific Metals Co., Ltd.
Louisville, Ky. S. W. H. Supply Co.
Madison, Wis. Gustave A. Larson Co.
Memphis, Tenn. United Refrig. Supply Co.
Miami, Fla. Berner-Pease, Inc.
Miami, Fla. Vernon-McDonald Co.
Milwaukee, Wis. Refrigeration Specialty Co.
Minneapolis, Minn. Refrig. & Industrial Supply Co.
Minneapolis, Minn. Vincent Brass & Copper Co.
Newark, N. J. Melchior, Armstrong, Dessau Co.
New Haven, Conn. Resco, Inc.
New Orleans, La. Enoch Sales Co.
New York, N. Y. Melchior, Armstrong, Dessau Co.
Oklahoma City, Okla. Mideke Supply Co.
Omaha, Nebr. Interstate Mach'y & Supply Co.
Peoria, Ill. R. E. Thompson Co.
Philadelphia, Pa. Melchior, Armstrong, Dessau Co.
Philadelphia, Pa. Victor Sales Corp.
Pittsburgh, Pa. Melchior, Armstrong, Dessau Co.
Portland, Ore. Refrigerating & Power Spec. Co.
Providence, R. I. Rhode Island Supply & Engineering
Raleigh, N. C. Henry V. Dick & Co.
Rochester, N. Y. Melchior, Armstrong, Dessau Co.
Rockford, Ill. Gustave A. Larson Co.
Sacramento, Cal. Hinshaw Supply Co.
St. Louis, Mo. R. E. Thompson Co.
San Antonio, Tex. Westbrook Carburetor & Electric Co.
San Francisco, Cal. California Refrigerator Co.
San Francisco, Cal. Pacific Metals Co., Ltd.
San Francisco, Cal. Refrigerating & Power Spec. Co.
Seattle, Wash. Refrigerating & Power Spec. Co.
Sioux City, Ia. Dennis Refrigeration Supply
Spokane, Wash. Refrigeration Parts Supply Co.
Springfield, Ill. United States Electric Co.
Springfield, Mass. Melchior, Armstrong, Dessau Co.
Springfield, Mass. C. P. Payson
Tampa, Fla. Bowen Refrig. Supplies Co.
Tulsa, Okla. Machine Tool & Supply Co.
Washington, D. C. Melchior, Armstrong, Dessau Co.
Waterloo, Ia. Winterbottom Supply Co.
West Palm Beach, Fla. Motor Parts & Equipment Co.
Worcester, Mass. Standard Supply Co.

Valves and Evaporators Can Also Be Purchased from the Following Jobbers

Albany, N. Y. Aird-Don Co.
Allentown, Pa. General Refrigeration Supply Co.
Brooklyn, N. Y. Capson & Co.
Brooklyn, N. Y. Coleman Electrical Supply Co., Inc.
Brooklyn, N. Y. Excel Refrigeration Supplies, Inc.
Harrisburg, Pa. Refrigeration Supply Co.
La Crosse, Wis. W. A. Roosevelt Co.
Louisville, Ky. Geo. Dehler Jr. & Co.
Newark, N. J. T. W. Binder Co.
New York, N. Y. Aetna Supply Co.
New York, N. Y. Federal Refrigerator Co.
New York, N. Y. Sam Glauber, Inc.
Omaha, Nebr. H. C. Noll Co.
Paterson, N. J. White & Shauger
Pittsburgh, Pa. William N. Orr Co.
Troy, N. Y. Aird-Don Co.
Wilkes-Barre, Pa. Radio Service Co.

PEERLESS of AMERICA, Inc.

NEW YORK FACTORY
43-20 34th Street
LONG ISLAND CITY

MAIN FACTORY • GENERAL OFFICES
515 West Thirty-fifth Street
CHICAGO

PACIFIC COAST FACTORY
3000 S. Main Street
LOS ANGELES

EXPORT DIVISION: P. O. Box 636, Detroit, Michigan, U. S. A.

Replacement Market Is Major Objective In Industry Program

(Concluded from Page 1, Column 5) erators added to this total. During the succeeding three years another four million will be added. The following two years will add an additional four million or more.

Looking ahead 10 years, then, the manufacturers of parts and supplies see a tremendous market of 13 million household units which will require replacement and rebuilding.

The All-Industry Exhibition is the opening gun in a program which has gradually been accumulating momentum, a movement to develop the replacement and obsolescence market on a big scale.

Trade-in refrigerators, after rebuilding and repairing, are being utilized as secondary units in basements and summer cottages, or are being sold to prospects whose incomes are so low that they would not be deemed good credit risks for the financing of new refrigerators.

This low-income market is indeed extensive, and undoubtedly should absorb all the rebuilt units which may be available in the next decade.

This issue of the NEWS, plus other announcements, is going to buyers all over the world, so that they may have sufficient time to make preparations for attending the show. Buyers from every part of the United States are expected, and exhibitors are counting on an especially large attendance from the middle western states.

Air-Conditioning Dealers And Contractors May Form National Association

(Concluded from Page 1, Column 3) experience in the hiring, training, and paying of salesmen will be reflected at the Chicago meeting.

Labor relations—Because the employment of labor presents many difficulties today unknown a few years ago, and because all air-conditioning systems from room coolers to large industrial and commercial contracts have labor included in the installation costs, this subject is of general interest.

Public relations—Articles by prominent physicians, complaints from the theater-going public, and other factors existing today show that the public needs a better understanding of what the air-conditioning industry is trying to accomplish. Cooperative methods of meeting this problem may be proposed.

Codes and regulations—Many cities have adopted or will soon adopt air-conditioning codes and regulations governing the use and operation of refrigeration machinery. Men in the industry are alert to the fact that uniformity in these regulations is highly desirable. Specialized regulations in certain communities will not only raise installation costs, but will increase the cost of products from the manufacturer where special designs and specifications are required.

Profit—Assuming that the air-conditioning contractor and dealer is in business to make a profit, it is fair to say that the quickest way to put air conditioning on a sound and

profitable basis is by an exchange of information about factors which affect the profit side of the business.

Air-conditioning contractors and dealers visiting the All-Industry Exhibition are urged to indicate their desire to attend the Chicago meeting at the time of registration.

Further details about the Chicago meeting will be published in forthcoming issues of the NEWS.

Copeland Shows Profit Of \$44,988 for Year

SIDNEY, Ohio—Preliminary report of Copeland Refrigeration Corp. for the 12 months fiscal year ended Sept. 30, 1938, shows a profit of \$44,988 before depreciation and federal income tax, according to Harry E. Thompson, president.

Current assets, including cash and receivables of \$78,151, totaled \$401,201, and current liabilities of \$76,654, or a ratio of 5.2 to 1. This compares with a ratio of 2.5 to 1 at Sept. 30, 1937.

Dollar sales volume, according to Mr. Thompson, compares favorably with 1937. Commercial sales were approximately 15% ahead, while domestic sales figures fell behind.

Memphis Distributor Sells 30 Carloads of Koch Cases

MEMPHIS, Tenn. — McGregor's Inc., distributor of Frigidaire household appliances and Koch commercial display cases and walk-in coolers, is celebrating sale of 30 carloads of Koch equipment.

Members of Steering Committees



J. D. COLYER
Vice President, Wolverine Tube
(President, Manufacturers Assn.)



FRANK J. GLEASON
Vice President in Charge of Sales,
Copeland Refrigeration Corp.



W. C. ALLEN
Vice President in Charge of Sales,
Modern Equipment Corp.



HERMAN GOLDBERG
Herman Goldberg Co.



J. L. SHRODE
President, Alco Valve Co.

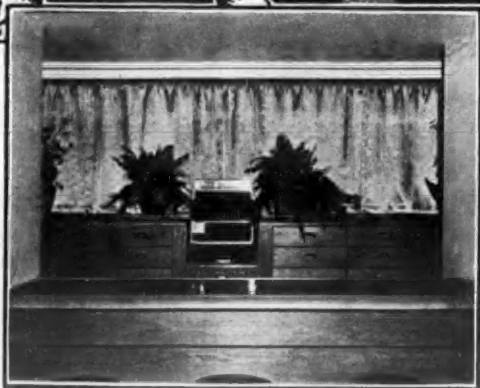


R. M. MCCLURE
Manager, All-Industry Exhibition.

REX B. CLARK'S LAKE NORCONIAN HOTEL



THE "CHARM CENTER OF THE WEST"



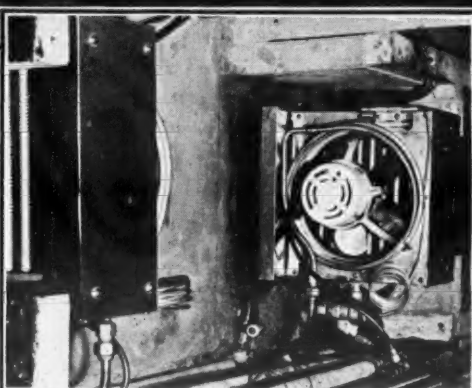
Lake Norconian Hotel
Norco, California

The "Mystery Room"
Lake Norconian Hotel

A-P Model 205 Thermo-
static Expansion Valves
used in The "Mystery
Room"

Manufacturer — Refriger-
ation Engineering
Company, Los An-
geles, Calif.

Dealer — R. W. Weid-
lein, Los Angeles,
Calif.



Rex B. Clark's Lake Norconian Hotel, nestled amid the beauty and grandeur of the Rockies, has a wealth of advantages, both natural and man-made, that give it rightful claim to "The Charm Center of the West." Among many clever innovations that please and interest guests is the famous "Mystery Bar."

Instead of the usual array of bottles and glasses on the backbar, these are all arranged in convenient drawers which are kept at a constant low temperature. Here, for the first

time, Refrigeration is used to keep glasses as well as liquor cold.

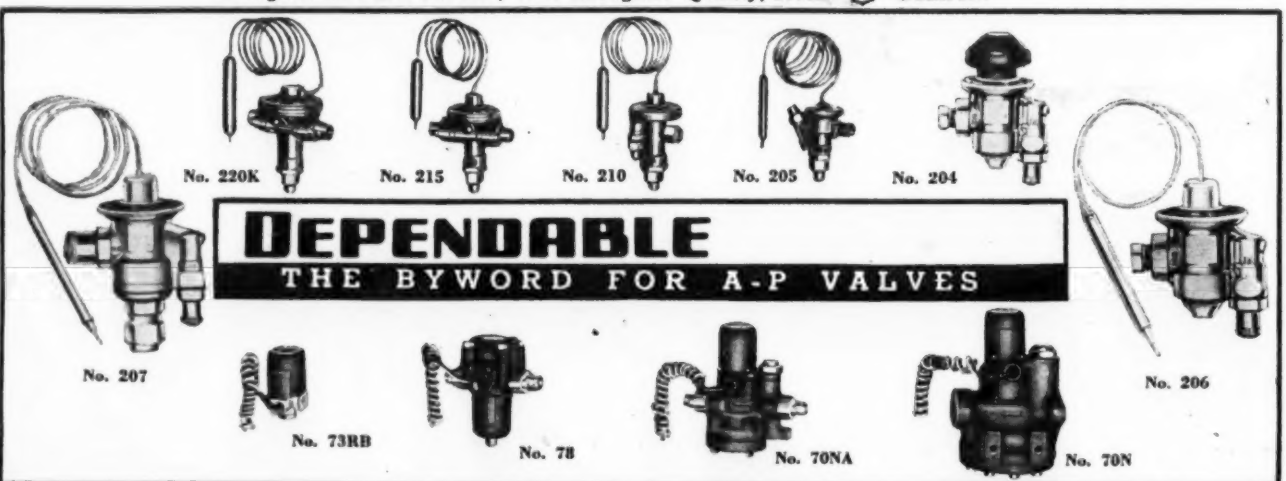
Refrigeration used is controlled by A-P Model 205 Thermostatic Expansion Valves.

The capillary tube on ALL A-P Thermostatic Expansion Valves is not sensitive to temperature changes.

AUTOMATIC PRODUCTS COMPANY

2450 NORTH THIRTY-SECOND STREET
MILWAUKEE WISCONSIN
Export Address: 100 Varick St., New York City

Refrigeration Parts Jobbers, Who Recognize Quality, Stock Controls.



THE COLD CANVASS

By B. T. Umore

(Concluded from Page 1, Column 1)

Speaking of Sockdolagers

Time magazine balks at swallowing such a sockdolager as "effective temperature."

Perhaps the Master Sheet Metal, Heating, Ventilating and Air Contractors Association, Inc. of Wisconsin can suggest something short and simple.

Member of the Family

Just received: A copy of Air Treatment Engineer (Vol. 1, No. 6, Oct. 1938) published at 4-12 Palmer St., Westminster, London, England, with a page headed "Talk of the Trade" by B.T.U. One of our English cousins, no doubt.

Disguise For Modern Villain

A murder plot, just exposed in Detroit, involves a woman who paid a supposed accomplice \$25 to call

at her victim's home, pose as a refrigerator service man, and put poison in a bottle of medicine kept in the refrigerator.

Apparently she assumed that no one would suspect a refrigerator service man.

The plot was foiled when the accommodating "villain" turned out to be a city detective.

F-12 Goes Collegiate

Temple university, known chiefly to the world-at-large as the place where "Pop" Warner coaches, has an extension course in refrigeration and air conditioning.

Recently Dick Dawson of Alco Valve was invited to talk to the second year class on refrigerant control.

When Dick walked up to the classroom where he was to talk, the number on the door stopped him so short he was in no position to begin his lecture for quite a spell. The number was F-12!

You can't tell Dick that those boys down at Kinetic Chemicals haven't a keen sense of publicity!

Incidentally, the Congress hotel in Chicago—adjacent to the Stevens, where the All-Industry Exhibition will be held in January—has a fine large room numbered F-12. Maybe "Dusty" Rhoades and his squadron would like to reserve it for the show.



This year she wants an Electrical Gift ★

★ A Ross Federal Survey made for Sales Management backs up General Electric's prediction . . . proves that more women want electrical appliances than any other gift this Christmas. (See October 1st Sales Management, page 18.)

The G-E Christmas Theme



*For the Practical Person
with a Sentimental Side!*

APPEARS IN 33,450,215 ADS IN 31 DAYS!

HERE'S a Christmas theme you can merchandise. It is built around all G-E appliances . . . refrigerator, range, dishwasher, disposal, ironer, washer, vacuum cleaner, radio and many small household appliances. Make it your own. Ask your customers to give "hours of freedom". Display the G-E gifts as advertised. Put up reprints of the advertisements. Make your store headquarters for Christmas' most wanted gifts. Wind up 1938 in a blaze of sales and profits!

**TAKE THE SAG OUT
OF YOUR SALES CURVE**

A tremendous campaign timed right on the nose!

Saturday Evening Post
Collier's
This Week
American Weekly
Liberty
Good Housekeeping
American Magazine
American Home
Esquire
Country Gentleman

November 26, December 3
December 3, December 10
December 4
December 11
December 10
December
December
December
December

TIE-IN-CASH-IN

General Electric Company
Room 1208, 570 Lexington Avenue
New York City

Yes Sir! I'm going after this Christmas business.
Please tell me how to get promotional helps.

Name

Firm

Address

City State AO

GENERAL  ELECTRIC

Specialty Selling Methods

Appliance Auction Used In Cooking School Is Profitable & Great Prospect-Getter

BELLEFONTAINE, Ohio—To give a little added punch to one of its recent cooking schools, Hayes' Radio & Electric Shop, Westinghouse dealer here, concluded it with an auction sale of all the equipment used in the cooking demonstrations.

This auction sale not only paid the entire expense of the cooking school, but also secured a "hot" prospect list of over 100 names, 15 of which were sold almost immediately. Appliances purchased by these 15 customers consisted of two refrigerators, one range, seven roasters, two irons, one washer, one ironer, and one vacuum cleaner.

The auction was not conducted in the usual way by means of oral bids. Instead, printed cards listing the items to be sold and giving the value of each were passed out to the crowd. Each bidder wrote her name and address on one of these cards, along with the price she was willing to pay for any of the appliances on which she was bidding.

BID CARDS YIELD NAMES

The bid cards were then tabulated and the high bidder for each appliance announced at the close of the evening meeting. All of the bids were kept, however, and used as a prospect list, on the theory that people would not enter bids unless genuinely interested in obtaining the appliances.

Tabulations showed that the successful bids in each case closely approximated the actual retail prices of the appliances, indicating that the public considers the existing prices fairly reasonable and equitable. For instance the refrigerator, which listed for \$227, sold in the auction at \$182. The washer, listing at \$54.95, was knocked down for \$41.03. In each

case a small margin of profit was made.

Cooking sessions were held in the high school auditorium, and approximately 250 people attended each performance. From this total of about 500 potential prospects, 108 unsuccessful bidders were lined up for future sales as follows: refrigerators, 9; ranges, 7; washers, 11; ironers, 8; cleaners, 13; roasters, 39; irons, 21.

TRAILER IS EMPLOYED

Miss June Mattuck, Westinghouse home economist, presented the demonstrations. She rolled up to Bellefontaine in an official Westinghouse trailer accompanied by Mr. Brunk and Mr. Goldenburg, officials of American Sales Co., Columbus, Ohio, and W. W. Electric Co., Springfield, Ohio, Westinghouse distributors.

The display trailer was one sold by Indian Trailer Corp. of America, Chicago, listing at \$488.

So pleased was the Hayes' organization with the cooking school and its results that they plan to make it a regular quarterly event.

Cash Prizes For Salesmen In Boston Sales Drive

BOSTON—More than \$50 a week in cash prizes will be distributed for the highest sales volume attained during the "Electric Refrigeration Job Makers' Campaign" sponsored by the Metropolitan Electric League, inaugurated Sept. 15 at a meeting in the Edison auditorium.

At the inaugural meeting, speakers representing manufacturers, distributors, dealers, and utilities endorsed the movement and outlined its details.

Chicago Utility Throws Spotlight on Kitchen In Contest For Housewives

CHICAGO—"Why I Would Choose This Kitchen" is the theme of a contest being sponsored by Commonwealth Edison Co. to promote sale of refrigerators, ranges, and other electrical kitchen equipment.

Five modern electric kitchens have been erected in the utility's loop store. Each one is arranged differently and contains different equipment.

Housewives are asked to examine each kitchen thoroughly, to indicate the number of the kitchen they like best, and then to add 50 words to the following statement: "I would enjoy having in my home the electric kitchen No. . . . because . . ."

One hundred prizes with a total value of \$2,632.85 will be awarded. The prize list includes a wide variety of electrical equipment which will be installed for the prize winners by Commonwealth Edison Co. The utility will make its regular allowance toward the cost of installing the electric ranges and water heaters awarded.

Judges of the contest are home economics editors of the local papers and Lyndon O. Brown, associate professor of marketing and advertising, Northwestern university.

Marshall Field's Store's New Kitchen Celebrated In 5-Day Program

CHICAGO—Special emphasis was placed on electrical kitchen appliances during the week of Oct. 3-8 by Marshall Field & Co. as part of a store-wide home furnishings promotion known as "Your Home Week."

To celebrate opening of the store's new "Modern Home Kitchen," which is equipped with a General Electric refrigerator, Miss Martha Pepper, household advisor for Marshall Field, conducted a five-day program dealing with food preparation.

'Miniature' Model Kitchen Competition To Precede Annual San Diego Show

SAN DIEGO, Calif.—A miniature model electric kitchen contest among high school and junior high school students will be one of the features of the sixth annual Electrical Show, sponsored by the Bureau of Radio & Electrical Appliances of San Diego County, to be held in Balboa Park here Nov. 29 through Dec. 4.

Competition will be held in advance of the show, and winning contestants will be awarded suitable prizes and the right to exhibit their entries during the exposition. Principal aim of the contest is to center interest in all-electric kitchens among those attending the event.

An extra night is being added to this year's electrical show, and afternoons will be eliminated with the exception of Saturday and Sunday. Show will be open from 6 to 10 p.m. on the first two nights, and

from noon to 10 p.m. on the last two. Last year's attendance at the show reached a new high mark of 90,000, reports J. Clark Chamberlain, secretary-manager of the bureau; with the extra night, he anticipates an attendance of 100,000 people at this year's event.

A special lighting section, introduced last year, has been enlarged for this year's event, to give the public a complete picture of lighting and wiring products and services now available; "Christmas Tree Lane," a feature of past shows, again will be a highlight of the event.

Wide publicity will be given the event, Mr. Chamberlain says, through city and county publications, radio, street car, and direct-mail advertising, window cards, theater talkie trailers, and outside signs.

Salesmen Find Lack of Sales Really Embarrassing As They Participate In a 'Dress Up' Contest

LUBBOCK, Tex.—Sales meant clothes—and lack of sales, embarrassment—in a contest staged among its salesmen recently by Sherrod Bros., appliance dealership with stores here and in Big Springs, Tex.

All salesmen started the "Dress Up Contest," as it was called, with a pair of shorts.

In order to add other apparel to their wardrobes, they had to sell enough appliances to reach a specified total (shown in the table below), and to become completely clothed they had to sell \$3,000 in Maytags, \$6,000 worth of Electrolux or General Electric equipment, or

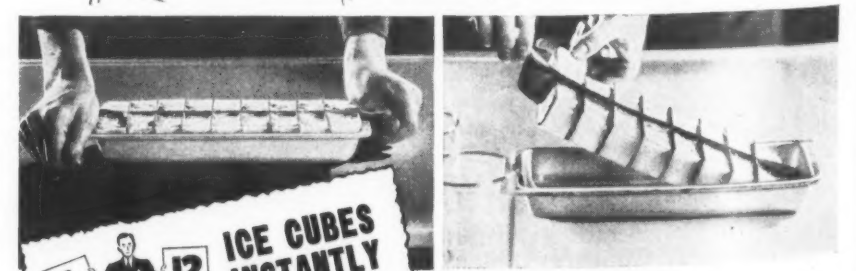
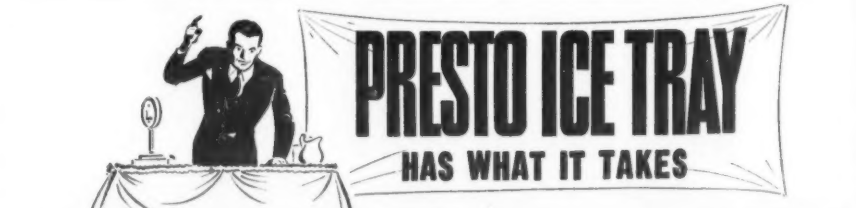
\$12,000 worth of Super-Cold commercial equipment.

Many of the men ended the contest fairly well dressed, but some finished without "trousers," last item to be added, several without coat or trousers, and a few unfortunates finished the contest in shorts, same raiment in which they started.

Quotas set by Sherrod Bros. for various wearing apparel items in the contest are given below. Figures represent total dollar volume, and the various articles are added to the salesmen's wardrobes as they attain that figure in sales of any one line of merchandise.

Sales Volume Translated in Terms of Man's Wardrobe

	Electrolux	Maytag	G-E	Super-Cold
Sock	1,000	500	1,000	2,000
Shorts	1,250	625	1,250	2,500
Undershirt	1,500	750	1,250	3,000
Sock	1,750	875	1,750	3,500
Shirt	2,000	1,000	2,000	4,000
Handkerchief	2,250	1,125	2,250	4,500
Tie	2,500	1,250	2,500	5,000
Belt	3,000	1,500	3,000	6,000
Buckle	3,500	1,750	3,500	7,000
Hat	4,000	2,000	4,000	8,000
Shoe	4,500	2,250	4,500	9,000
Coat	5,000	2,500	5,000	10,000
Shoe	5,500	2,750	5,500	11,000
Trousers	6,000	3,000	6,000	12,000



There is no doubt about it—the greatest need for ice cubes is on those frequent daily occasions when one, two, or three persons want a few ice cubes in a hurry. And only Presto Tray with Rubber Grid has what it takes to give one or a dozen cubes instantly, full-sized, cold

and dry, without disturbing the others. No fuss! No bother! No waste! In less time than it takes to tell, your salesman can demonstrate conclusively how only the Magic Finish Presto Tray with Rubber Grid gives all the advantages of a fast-freezing metal tray plus all the conveniences of a rubber grid. If you have not already done so—be sure and insist that your new refrigerator come factory-equipped with Magic Finish Presto Ice Trays.

INLAND MANUFACTURING DIVISION
General Motors Corporation Dayton, Ohio

WHEN A FEW ICE CUBES ARE PLENTY... DON'T RAID A TRAYFUL... USE
PRESTO ICE TRAY with Rubber Grid

You give customers new economy when you use this insulation

Your reach-in and walk-in cooler customers want the least possible month-to-month refrigeration expense. However, the only way to keep refrigerating cost low is to give adequate insulation protection. It was to fill the need for an efficient refrigerator insulation that Dry-Zero was invented.

Minimum Operating Cost

Insulation saves refrigeration by warding off heat. How effectively a given insulation wards off heat is measured in Btu's (British thermal units). Independent authorities, such as the U. S. Bureau of Standards, have given Dry-Zero the remarkably efficient rating of .24 Btu..

This means that you offer customers minimum refrigerating expense when you use Dry-Zero for insulation.

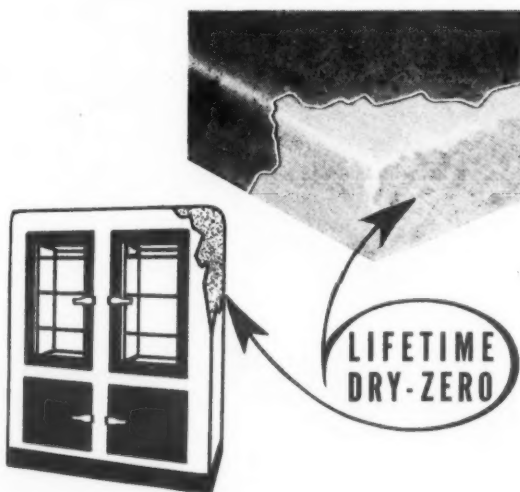
Lasts for a Lifetime

Another factor in refrigerating cost is the effective length of life of the insulation.

Hidden away in heavy walls, the insulation may seem secure from damage. But, water vapor inevitably enters the insulation space. If this water vapor soaks the insulation, the insulation efficiency is destroyed.

Numerous tests plus years of refrigerator experience show that Dry-Zero repels moisture and does not become water soaked. Reports from numerous manufacturers of refrigerators, refrigerated motor trucks, and railroad refrigerator cars attest this fact. Of course, this means that the original thermal efficiency of Dry-Zero lasts for life.

Investigate Dry-Zero insulation today. Write for a free copy of the factual booklet, "Fundamentals of Good Refrigerator Insulation."



USED BY MILLIONS—Dry-Zero insulation has been used in millions of household refrigerators, in thousands of refrigerated motor trucks, and in 7 out of 10 new railroad refrigerator cars. Dry-Zero insulation has been taken from railroad refrigerator cars 12 years old and used over again in new cars. It has been removed from obsolete motor trucks and put into new ones. Repeated laboratory tests show that Dry-Zero repels water and rot and fungus growths; it will never develop smells; nor will it sag down into useless lumps. This evidence is proof of its durability and continued high insulating efficiency over long periods of time.

Let Dry-Zero engineers cooperate on the insulation of your refrigerators and show cases. They can advise on the best insulation procedure for any type of construction or any needed temperature requirements. There is no obligation for this service.

DRY-ZERO
INSULATION
The Most Efficient
Commercial Insulant Known

Write for sample

DRY-ZERO CORPORATION • CHICAGO • TORONTO

Copeland

DEPENDABLE ELECTRIC REFRIGERATION

Completes a Most Successful Year

The Advertisement Below
Appeared About a
Year Ago

REPRINT AD FROM AIR-CONDITIONING AND REFRIGERATION NEWS

THE NEWS ABOUT COPELAND

THE control of Copeland, one of the pioneer firms in the electrical refrigeration field, has been acquired by a group of men who are likewise numbered among the industry's pioneers. Headed by Harry E. Thompson, Copeland's new president, this group, both individually and collectively, boasts an unique record of past achievement which holds bright promise for the future of Copeland and Copeland's dealers and distributors.

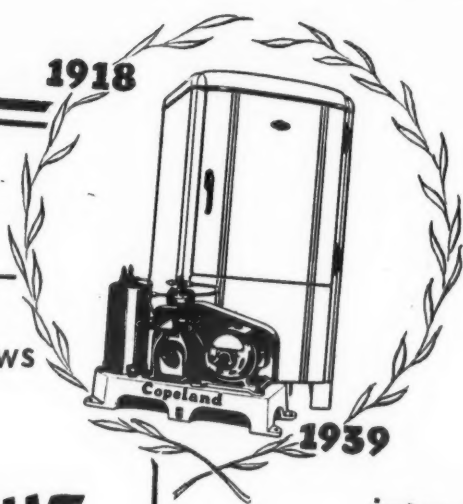
In their varied and important executive positions in the refrigeration business, these men have proven themselves astute merchandisers and resourceful engineers. Not only has sales success crowned each of their efforts, but they have been responsible for many outstanding contributions to the mechanics of refrigeration as well. Their association with Copeland points to the company's uninterrupted progress and growth.

They are uniquely capable of carrying on advanced engineering policies which will insure Copeland's continual leadership from a mechanical standpoint. They are uniquely capable of continuing and augmenting Copeland's famed standards of precision manufacture. Above all, they are uniquely capable of cooperating with Copeland's dealers and distributors in making an outstanding product an exceptionally profitable one to sell.

If you are interested in considering the opportunities which Copeland may offer you, we shall be glad to place your name on the mailing list of those who will receive all up-to-the-minute news from Copeland the instant it is released. Simply write and say that you would like to be kept informed of Copeland's new plans for 1939 in advance of the general trade announcements.

COPELAND
REFRIGERATION CORPORATION
SIDNEY, OHIO

PIONEER MANUFACTURERS OF ELECTRICAL REFRIGERATION



YOU may have read the Copeland advertisement reproduced at the left. It appeared about a year ago, shortly after the present management acquired control of Copeland. We believe you may now be interested in learning what has been accomplished in the comparatively short time since that announcement was made.

During 1938 Copeland has kept its sales and production at consistently high levels.

It has offered steady employment to a large working force.

It has widened its distribution.

It has balanced its progress in both household refrigerators and commercial units.

It has maintained at all times a full research and development program to guarantee even better Copeland Refrigeration for 1939 and the years to follow.

All of which means that Copeland has enjoyed a most successful year. Furthermore, it has been a tangible success in the sense that it has been a profitable year for the company and for its distributors and dealers.

**For 1939 Copeland has even more ambitious plans.
To learn about them and the opportunities they offer you--Write today.**

COPELAND REFRIGERATION CORPORATION, SIDNEY, OHIO
PIONEER MANUFACTURERS OF HOUSEHOLD AND COMMERCIAL ELECTRIC REFRIGERATION

Exhibitors Will Display New Products & Services in Chicago, Jan. 16-19

64 Concerns Have Reserved Space

The following companies have reserved space for exhibits at the first annual all-industry Refrigeration and Air-Conditioning Exhibition. Reports indicate that many more will be added to the list before the show opens at the Stevens hotel, Chicago, Jan. 16-19, 1939.

Acme Industries, Inc., Jackson, Mich.
Aerovox Co., Brooklyn, N. Y.
Air-Maze Corp., Cleveland, Ohio.
Alco Valve Co., Maplewood, Mo.
Aluminum Co. of America, Pittsburgh, Pa.
American Brass Co., Waterbury, Conn.
American Injector Co., Detroit, Mich.
Ansul Chemical Co., Marinette, Wis.
Automatic Products Co., Milwaukee.
Bonney Forge & Tool Works, Allentown, Pa.
Brunner Mfg. Co., Utica, N. Y.
Bush Mfg. Co., Hartford, Conn.
Business News Publishing Co., Detroit, Mich.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago-Wilcox Mfg. Co., Chicago.
Commercial Coil Co., Chicago, Ill.
Copeland Refrigeration Corp., Sidney, Ohio.
Dayton Rubber Mfg. Co., Dayton, Ohio.
Detroit Lubricator Co., Detroit, Mich.
Dole Refrigerating Co., Chicago, Ill.

E. I. du Pont de Nemours & Co., Inc., Wilmington, Dela.
Duro Metal Products Co., Chicago.
Electromatic Corp., Chicago, Ill.
Fedders Mfg. Co., Inc., Buffalo, N. Y.
Gates Rubber Co., Denver, Colo.
General Electric Co., Schenectady, N. Y.
L. H. Gilmer Co., Philadelphia, Pa.
W. A. Hammond Drierite Co., Yellow Springs, Ohio.
Henry Valve Co., Chicago, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Larkin Coils, Inc., Atlanta, Ga.
Marlo Coil Co., St. Louis, Mo.
Jas. P. Marsh Corp., Chicago, Ill.
Maurey Mfg. Co., Chicago, Ill.
McIntire Connector Co., Newark, N. J.
Mills Novelty Co., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Modern Equipment Corp., Defiance, Ohio.
Mueller Brass Co., Port Huron, Mich.

Peerless of America, Inc., Chicago.
Penn Electric Switch Co., Goshen, Ind.
Perfection Refrigeration Parts Co., Harvey, Ill.
Perflex Corp., Milwaukee, Wis.
Ranco, Inc., Columbus, Ohio.
Refrigeration & Air Conditioning Institute, Chicago, Ill.
Refrigerating Specialties Co., Chicago, Ill.
Riley Engineering Co., Detroit, Mich.
South Bend Lathe Works, South Bend, Ind.
Spoehrer-Lange Co., Inc., St. Louis, Mo.
Starr Piano Co., Refrigeration Div., Richmond, Ind.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Tecumseh Products Co., Tecumseh, Mich.
Texas Co., New York, N. Y.
Tyler Fixture Corp., Niles, Mich.
Universal Cooler Corp., Detroit, Mich.
Utilities Engineering Institute, Chicago, Ill.
Van Cleef Bros., Chicago, Ill.
Virginia Smelting Co., West Norfolk, Va.
Victor Mfg. & Gasket Co., Chicago.
Wagner Electric Corp., St. Louis, Mo.
White-Rodgers Electric Co., St. Louis, Mo.
Wolverine Tube Co., Detroit, Mich.
Zenith Carburetor Co., Detroit, Mich.

Plans For Exhibits Are Explained

Those manufacturers who have completed plans for their displays have furnished the following information about their proposed exhibits and also tell how they plan to promote attendance at the show.

Acme Industries, Inc.

Because the nature of its products is such as to make impractical any actual display, Acme Industries, Inc., manufacturer of refrigeration and air-conditioning parts and supplies, plans to show its entire line by means of enlarged photographs, states M. B. Williston, sales manager.

These photographs will, in many cases, show cut-away sections. In all instances, they will enable the company's representatives to point out construction and operation of the items pictured.

Acme products are distributed primarily through established district offices of major compressor manufacturers, such as General Electric Co., Westinghouse Electric & Mfg. Co., Kelvinator division, Nash-Kelvinator Corp., and Frigidaire division, General Motors Corp.

"We are urging exhibits by the major companies," Mr. Williston says, "and are endeavoring to induce their distributors to attend the session. It is our opinion that more compressor manufacturers should be induced to exhibit at the show."

Air-Maze Corp.

Cleanable air filter panels and panel-holding frames for air-conditioning applications as well as for installation in range hoods or canopies in kitchens will be on display in the booth of Air-Maze Corp., says F. M. Paul, advertising manager. The company expects to introduce at the show a new product, as yet unannounced, he reports.

Sales of Air-Maze products are made through distributors, sales engineer representatives, jobbers, and a few dealers.

Representatives of the company have been instructed to mention the exhibition during the course of their regular contact work.

Alco Valve Co.

Alco Valve Co. has reserved two booths in which to exhibit its entire line of engineered refrigerant controls, including thermostatic expansion valves, automatic expansion valves, magnetic stop valves, float switches, and float valves, according to Roger P. Kipp.

The display will be designed to show the "life" tests to which all Alco products are subjected.

Introduced at the show will be a complete new line of magnetic stop valves, featuring specially designed coils which are subjected to a new water-proofing process. The company also will introduce a new multi-outlet thermo valve which is said to have shown, under tests, increased

distribution efficiency up to 35% and increased capacities up to 23%.

The company distributes its products through factory salesmen and jobbers, and would like to have manufacturers, contractors, and engineers see its exhibit at the show. Riders urging attendance at the exposition will be added to company mailings and literature.

Aluminum Co. of America

Various forms of aluminum used in construction of refrigeration and air-conditioning apparatus, such as sheet metal, castings, screw machine products, and extruded shapes, will feature Aluminum Co. of America's display at the exposition, reports F. L. Gemmer.

In addition, the company's booth will contain exhibits of various non-aluminum products used in air conditioning, such as drying gases, etc. While no particularly new or startling developments will be on display, all latest applications of the company's aluminum and non-aluminum products will be shown.

Manufacturers of refrigeration and air-conditioning equipment, and suppliers of sub-assemblies used by these manufacturers, comprise the principal market for this company's products, although some items, such as activated alumina, also are sold to service engineers. It is these types of prospective customers which the company hopes to see at the exposition.

American Injector Co.

Several working models will feature the display of American Injector Co.'s complete line of refrigeration products, President Herbert B. Trix announces. Though some new products will be exhibited, no announcement concerning these products is being made at present.

Distribution of the firm's products is chiefly through established refrigeration jobbers who conform to the standards of the National Refrigeration Supply Jobbers Association and who encourage membership in this organization. The company also sells directly to manufacturers of refrigeration units, but does not sell to dealers or service men.

American Injector customers already have been advised by letter that the firm is going to have an exhibit at the show, and have been urged to attend. This invitation will be followed up with another letter early in December.

Automatic Products Co.

Featuring the Automatic Products Co. exhibit will be the new fractional tonnage expansion valves, including the A-P model 206 fixed superheat thermostatic expansion valve designed for household refrigerators, beverage coolers, room-cooling units, and other small refrigeration units rated from 1/4 to 1/2 hp.

Another new A-P expansion valve to be displayed is the model 204 automatic, also designed for fractional tonnage units. This valve has a special adjustment of back pressure provided for under a rubber breather cap which permits manual adjustment to assure a steady gauge reading of pressure.

Its principal purpose is to feed the refrigerant into the evaporator in correct proportions to maintain maximum evaporator efficiency without frost back at the compressor unit, and also to prevent the flow of refrigerant during the off period.

(Continued on Page 9, Column 1)

See Us at BOOTH 142

See for yourself the instantaneous cooling, the positive temperature control, the perfect foam control of Coltrol liquid coolers. If you can't get to the Convention, we would like to mail you some useful free data.

COLTROL D-X
Commercial Coil & Refrigeration Co.
457 N. Artesian Ave., Chicago, Ill.



Examining Balsam-Wool insulation taken from 12-year-old refrigerator.

"DISSECT"
12-YEAR-OLD REFRIGERATOR—
FIND BALSAM-WOOL IN PERFECT CONDITION!

Home—that's the final proving ground for the permanent performance of any refrigerator insulation. After 12 years of testing in this proving ground, Balsam-Wool is still performing 100%. Here are the facts—

Recently, a 12-year-old refrigerator was taken from the kitchen of a Chicago apartment house and torn down in the presence of qualified witnesses. The Balsam-Wool, after 12 years in continuous operation, was nestled snugly clear to the top of the box—no packing or settling had occurred. T. Shantz Hansen, Superintendent of the Minnesota State Forestry Experimental Station, found the Balsam-Wool dry as toast and clean as the day it was installed. There was not a trace of moisture, packing or disintegration.

Whether used in hermetically sealed spaces—as in the 12-year-old refrigerator—or in the form of sealed slabs, Balsam-Wool insulation is the sure and economical way to obtain lasting insulation efficiency for refrigerators . . . as use in more than 3,700,000 refrigerators has proved. Complete information will be worth while having—write for it!

WOOD CONVERSION COMPANY

Refrigeration Sales Division
360 North Michigan Ave.
Chicago, Ill.

St. Paul, Minn.

New York, N. Y.

BALSAM-WOOL

SEALED INSULATION SLABS

PRODUCT OF WEYERHAEUSER

ECONOMICAL

PALCO
INSULATION
WOOL

Offers Permanent Thermal Efficiency (255 B.T.U. Pebbles) at lowest possible cost. Light weight—goes further. Non-setting. Odor and vermin-proof. Fire-resistant—repels moisture.

Write for 16-page Insulation Manual and free sample.
THE PACIFIC LUMBER COMPANY
San Francisco Chicago
Los Angeles New York

DURABLE AS THE REDWOODS

Manufacturers Plan Exhibits For First All-Industry Show

(Continued from Page 8, Column 5)

Another new valve will be the new A-P model 207 thermostatic expansion valve with adjustable superheat, with capacities up to 1/4-ton Freon and 1 1/2 tons methyl chloride. This valve is designed especially for the small refrigeration and air-conditioning field where an adjustable superheat valve can be advantageously used.

In addition to these products, the A-P display will feature the standard thermostatic expansion valves, solenoid valves, a complete line of solenoid refrigerant valves in capacities up to 50 tons, thermostats, and humidistats.

Of special interest will be the new streamlined A-P thermostat with heat anticipator. This unit is a plastic moulded thermostat modern in style and highly efficient in operation.

The thermostatic expansion valves displayed will range in capacity from fractional tonnage units as low as 1/4 ton to the larger refrigeration systems of 30 tons and over.

Through direct mail and trade paper advertising, Automatic Products Co. will promote attendance at the exhibition. Special mailings highlighting the A-P exhibit at the exposition will be sent to a mailing list of refrigeration and air-conditioning concerns and individuals.

Under its present distribution set-up, Automatic Products sells through refrigeration parts jobbers to dealers, engineers, and service men, as well as to manufacturers of refrigeration equipment.

Bonney Forge & Tool Works

Bonney Forge & Tool Works will show its complete line of service tools, and hopes in this way to contact numerous representative of the jobbing and service organizations to which it sells, reports S. R. Robinson, advertising manager.

Bush Mfg. Co.

Bush Mfg. Co. plans to exhibit its line of regular commercial coils, including unit coolers, ice-makers, circulator coils, etc., announces C. A. MacArthur. These products are distributed through jobbers, manufacturers' representatives, and direct representatives.

Chicago-Wilcox Mfg. Co.

Chicago-Wilcox Mfg. Co., which makes gaskets for the refrigeration industry, intends to display this type of equipment, says E. J. Zoll, and the exhibit probably will include some new developments in the field. This company sells direct to manufacturers of original equipment, and supplies the replacement trade through jobbers. Naturally the company would like to have jobbers as well as chief engineers of the manufacturing companies in attendance at the show, and will contact these branches of the industry in an attempt to encourage attendance.

Commercial Coil & Refrigeration Co.

The "Coltrol" line of beverage coolers, along with other equipment necessary in the beer drawing and beer refrigerating field, will be displayed in the exhibit of Commercial Coil & Refrigeration Co., Chicago, announces G. William Gauger.

"We expect to give a general idea to the dealers of the general properties of beer and what is required in beer drawing to insure perfect draught," Mr. Gauger stated. "We would like to have refrigeration jobbers, dealers, and service men attend the show for the purpose of familiarizing them with our Coltrol products, and to present the importance of proper refrigeration in the beverage cooling field as it exists today."

A letter, or similar form of information, will probably be sent by Commercial Coil & Refrigeration Co. to jobbers, dealers, and service men throughout the country describing the Coltrol lines, announcing the Coltrol exhibit, and telling of the exposition.

At the present time, Coltrol prod-

ucts are distributed through refrigeration jobbing houses, including Melchior, Armstrong, Dessau Co., Williams & Co., Inc., and Automatic Heating & Cooling Supply Co.

Copeland Refrigeration Corp.

The complete line of products manufactured by Copeland Refrigeration Corp. will be represented at the show, announces Vice President Frank J. Gleason. This will include commercial units, water coolers, household refrigerators, and parts for both current and past models.

The company expects to show its 1939 lines of equipment in both the household and commercial field. The household models will differ from this year's models in cabinet design and interior appointments, Mr. Gleason reports, while commercial units will incorporate new features in valve design, etc., as developed during the past year.

"We believe," he says, "that the exposition will attract all classes of buyers to which we now sell, including distributors, jobbers, manufac-

turer accounts, and department stores. To create interest in the show we plan to advise our customers and prospects of the benefits we believe they would derive from attending it."

Dole Refrigerating Co.

Many complete pictures of various locker plant installations, and possibly a miniature refrigerated locker plant, will be displayed in the Dole Refrigerating Co. exhibit, in addition to DoleCo holdover truck plates, ice cream cabinet conversion units, soda fountain conversion units, and the patented vacuum plates as used in refrigerated locker systems, announces H. E. Clay, sales manager.

Information in data books will be available to anybody interested in this type of work at Dole display, Mr. Clay added.

"We plan to give the exhibition a little advertising by inserting the announcement of it in possibly the December and January advertisement we run in the various ice cream trade publications," said Mr.

Clay, "and we have informed our sales department to have the salesmen spread the gospel and the good word regarding the convention at every opportunity."

"The type of buyers that we would like to have attend the convention are ice cream manufacturers, together with their service departments, the managers of the various refrigerating machine factory branches and distributors, together with their engineering departments, and the manufacturers of all counters, coolers, beverage coolers, ice cream cabinets, and frosted food cabinet equipment."

"Our present methods used in distributing our products are through many of the jobbers who are members of the National Refrigerating Jobbers Association, through many of the large refrigerating machine manufacturers, factory branches, and distributors, and through our own direct selling force."

DoleCo patented vacuum plates are made in three standard designs for overhead refrigeration, display

case or window refrigeration, and wall plate refrigeration.

For overhead refrigeration, the vacuum plates are made in multiple sections.

E. I. du Pont de Nemours & Co., R. & H. Chemicals Dept.

An exhibit centering on "Artic" methyl chloride will be staged at the convention by The R. & H. Chemicals Department of E. I. du Pont de Nemours & Co., Inc., relates J. J. Landy, advertising manager for the R. & H. division.

"At the present time our plans call for a typical display, although we may decide to do something quite different as our plans progress," says Mr. Landy.

Items of interest concerning the convention and various announcements and bulletins will be published in Artic Service News, R. & H. house organ issued frequently, to stimulate interest in the convention and promote attendance, Mr. Landy declared.

(Continued on Page 10, Column 1)



KEROTEST SALUTES "AIR CONDITIONING & REFRIGERATION NEWS" ON THE OCCASION OF ITS 500th CONSECUTIVE ISSUE!

IN the 500 consecutive issues of *Air Conditioning & Refrigeration News* has been mirrored and recorded the epochal developments of a great and growing industry.

Sharing in the progressive story of modern refrigeration is the prominent part Kerotest has played in its development. This pioneer manufacturer made the first commercial shipment of refrigeration valves and fittings in 1924.

Outstanding among the many Kerotest "firsts" since the inception of the refrigeration industry are:—(1) the first forged valves and fittings superceding cast valves . . . (2) introduction and development of the one and only Kerotest Dia-

phragm Packless Valves . . . (3) the famous Kerotest G-W Control . . . (4) introduction of a complete line of forged steel manifolds with Diaphragm Packless Valves . . . (5) Diaphragm Packless Valves with Sweat connections integral with valve body . . . (6) Kerotest Automatic Relief Valves, and many other original developments too numerous to mention.

With this rich background of achievement and experience, the Kerotest organization carries on . . . blazing new trails of advancement in modern refrigeration and air conditioning control that your requirements may continue to be best served.

See us at Booth 97—"All-Industry Refrigeration and Air Conditioning Exhibit"

KEROTEST

KEROTEST MANUFACTURING CO. · PITTSBURGH, PA.

All Types of Products Used By Industry To Be on Exhibition

(Continued from Page 9, Column 5)

The R. & H. product, Artic (du Pont methyl chloride), is for the most part distributed through jobbers to the various types of consumers.

Fedders Mfg. Co.

Featuring a number of new products to be introduced to the industry for the first time at the exhibition, the Fedders Mfg. Co. display will include all electric refrigeration and air-conditioning products made by the company, announces H. E. Rieckelman, vice president in charge of sales.

Fedders will promote attendance at the show by publishing information in the house organ Fedders News, and by direct mail and personal contact, Mr. Rieckelman said.

"We are going to exert every effort through our own organization to bring as many people as possible to the show so that this will be a very satisfactory exhibition," declared Mr. Rieckelman, "not only from our own company's standpoint, but from that of all other exhibitors."

Present method of distributing Fedders products is through jobbers, distributors, and manufacturers.

"We would like the jobbers, distributors, and manufacturers of refrigeration appliances to attend the exhibition," Mr. Rieckelman said.

L. H. Gilmer Co.

The L. H. Gilmer Co. display will feature the 1939 line of improved Gilmer belts for use in electrical refrigeration units. Gilmer's complete selection of belts will be shown in the exhibit, announces H. W. Weihermayer, Jr., sales promotion manager.

"Our method of distribution is restricted to recognized refrigeration parts jobbers," said Mr. Weihermayer. "These, together with representatives of equipment accounts, we should like to see attend the exhibition."

Imperial Brass Mfg. Co.

"We are planning an exhibit of refrigeration valves, fittings, and tools, and we expect to have several new products that we will introduce at that time," stated C. H. Benson of the sales extension department of Imperial Brass Mfg. Co.

"Our method of distribution," Mr. Benson said, "is through the refrigeration and air-conditioning jobbers."

Kerotest Mfg. Co.

Exhibit of Kerotest Mfg. Co. will consist of selected items from its line of valves and fittings, some of which will be shown for the first time, announces J. A. Strachan, sales manager.

The Kerotest company, like most parts and supplies manufacturers, distributes its products to dealers, distributors, and servicemen, through its various jobber outlets. Unit manufacturers, after being contacted by factory representatives, are sold direct from the company's headquarters in Pittsburgh.

Mr. Strachan hopes that the

exhibition will attract engineers from various unit manufacturers, dealers, and distributors, servicemen, refrigeration parts and supplies jobbers, case manufacturers, and any other groups whose prime interest is the manufacturing, merchandising, or installation of refrigerating or air-conditioning units, or the selling of parts and supplies.

Marlo Coil Co.

Marlo Coil Co., St. Louis manufacturer of fin coils and air-conditioning coils, is making plans to exhibit a general line of its products, featuring several new items to be initially introduced at the exposition, A. T. Marlo announces.

To promote attendance at the show, Marlo's field representatives are "talking up" the event during their calls on customers and prospects, Mr. Marlo said.

Marlo products are channeled through distributors in protected territories when sold to the general trade, Mr. Marlo explained.

McIntire Connector Co.

McIntire Connector Co., Newark, N. J. intends to exhibit its complete line of units comprising the "D F N" system for drying, filtering, and neutralizing moisture, sediment, and acid accumulated in mechanical refrigerating systems, reports H. A. Chandler, secretary.

"The D F N system," Mr. Chandler explained, "consists of a series of interchangeable units, so designed that they will adapt themselves under any condition for the control of moisture, sediment, and acid in the refrigeration system."

With this system, Mr. Chandler

continued, the three common causes of service expense can be controlled.

"The system comprises a series of demountable flange shells, each size having 1 hp., or tonnage, rating. The charge for these shells is in cartridge form, and each cartridge is a complete unit designed for a specific purpose—to be used singly or in multiple as occasion requires," said Mr. Chandler.

"A wide variety of cartridges is available, including permanent and temporary drying charges, screen strainers, progressive filters, and neutralizers. Through the use of these cartridges in proper combination, the maximum results will be obtained, and service calls reduced. A series of standard non-refillable D F N units charged ready for use also is available.

"In addition to the present D F N line, several new and novel designs of small strainers and filters will be exhibited. We also intend to introduce a moisture detector. For the first time the industry will have available a unit which will provide an answer to the question 'when should a drier be used' and 'when should a drier be taken off' and/or 'when should a drier be replaced.'"

McIntire will promote interest in and attendance at the exhibition by advertisements in trade papers, by mail, and by direct contact, Mr. Chandler said.

At present, McIntire products are distributed through refrigeration supply jobbers and through direct sales to manufacturers.

"The types of buyers we are interested in," Mr. Chandler stated, "are manufacturers of condensing units; manufacturers of show case equipment, ice cream cabinets, beverage coolers, and all those using mechanical refrigerating equipment; refrigeration supply jobbers; distributors and dealers of both commercial and domestic refrigeration; and independent refrigeration service engineers."

In addition to the D F N system equipment, McIntire Connector Co. also manufactures seamless copper splicing sleeves and tinned copper connectors.

Mills Novelty Co.

Compressors for commercial refrigeration and air-conditioning applications will comprise the Mills Novelty Co. exhibit, according to an announcement by B. Regan, secretary of the company's commercial refrigeration division.

Mills products reach the consumer through the usual distributor-dealer channels.

Minneapolis-Honeywell Regulator Co.

Minneapolis-Honeywell Regulator Co.'s Polartron control system, a comparatively recent introduction, will be the stellar attraction in that company's exhibit, which will include its entire refrigeration line, according to G. B. Benton, advertising manager.

The balance of its line of refrigeration controls will also be shown, Mr. Benton stated.

The company sells through established manufacturer, jobber, and dealer channels, and would be pleased to have these branches of the industry well represented in the exposition's attendance list.

Mueller Brass Co.

New products will feature the Mueller Brass Co. exhibit, these items including the "triple seal" valve which is operated on a principle entirely different to that on which valves manufactured for the purpose have operated in the past, J. R. Wightman, advertising manager, announces.

"We will have some new relief valves, heat interchanger tees, and we hope to have a representative line of improved design solder-type fittings," said Mr. Wightman.

In addition to the new products, the Mueller display will present valves, fittings, and installation accessories for refrigeration and air conditioning at present manufactured by the company.

To promote attendance at the convention, Mueller Brass plans to issue direct mail announcements, giving prospects an idea of what will be displayed and inviting them to inspect the Mueller exhibits.

An announcement line concerning the exhibition also will be printed at the foot of Mueller advertisements and other forms of publicity, Mr. Wightman added.

Mueller products are distributed through refrigeration jobbers to distributors, service men, and other individuals directly or indirectly associated with refrigeration and air-conditioning installation, maintenance, service, and repair work.

Peerless of America, Inc.

Peerless of America will exhibit every product of its manufacture, including refrigeration and air-conditioning products and heating equipment, M. W. Knight, general sales manager, announces.

Featuring the Peerless exhibit will be new unit heaters using the new high dispersion coil in a case with crackle finish, a new line of expansion valves, and new water coolers.

Many of the present Peerless products will be restyled and improved to embody more eye appeal, Mr. Knight said.

Plans to promote attendance at the exhibition include stickers on all mail going out of the three Peerless factories, and the distribution of folders and other literature supplied by the All-Industry Promotion Committee.

"We also plan on mailing hundreds of the 500th issue of AIR CONDITIONING & REFRIGERATION NEWS to some of our mailing list," Mr. Knight stated.

Peerless representatives throughout the country are "talking up" the exhibition to everyone on whom they call, Mr. Knight added.

Peerless' present method of distributing its products is through manufacturers, jobbers, distributors, dealers, and service men.

Ranco, Inc.

Spotlight of the Ranco, Inc. exhibit will be focused on the type "G" all-purpose commercial control, declared M. S. Vidis. Mr. Vidis added that many persons in the industry are not acquainted with this particular Ranco product, and the exhibition will be a good place to become familiar with it.

The Ranco display also will include the standard production controls for household and commercial refrigeration.

"Methods used in distributing (Continued on Page 11, Column 1)

Proud Heritage of the Past... a Challenge for the Future—

C

onfidence of the refrigeration industry

cannot be bought with dollars or stolen with promises. It must be

earned. Penn has chosen to earn its place in the industry by

building controls that broaden the use and, obviously, the sale of

refrigeration equipment! . . By building controls that do their work,

year after year, unfailingly! . . By building a line that supplies the

equipment manufacturer, the parts and accessories jobber, and the

service engineer, with a standard control for every refrigeration appli-

cation. The number of jobs going in today with Penn Controls is evi-

dence of your confidence in our product and our service. We are proud

of this record and we thank all of you for making it possible. Yet

we consider this not as the achievement of a goal, but as a challenge

to all of us . . designers, research engineers, builders, test engineers

and field engineers . . to serve the refrigeration industry in the

future, in a way that will continue to merit your confidence. If

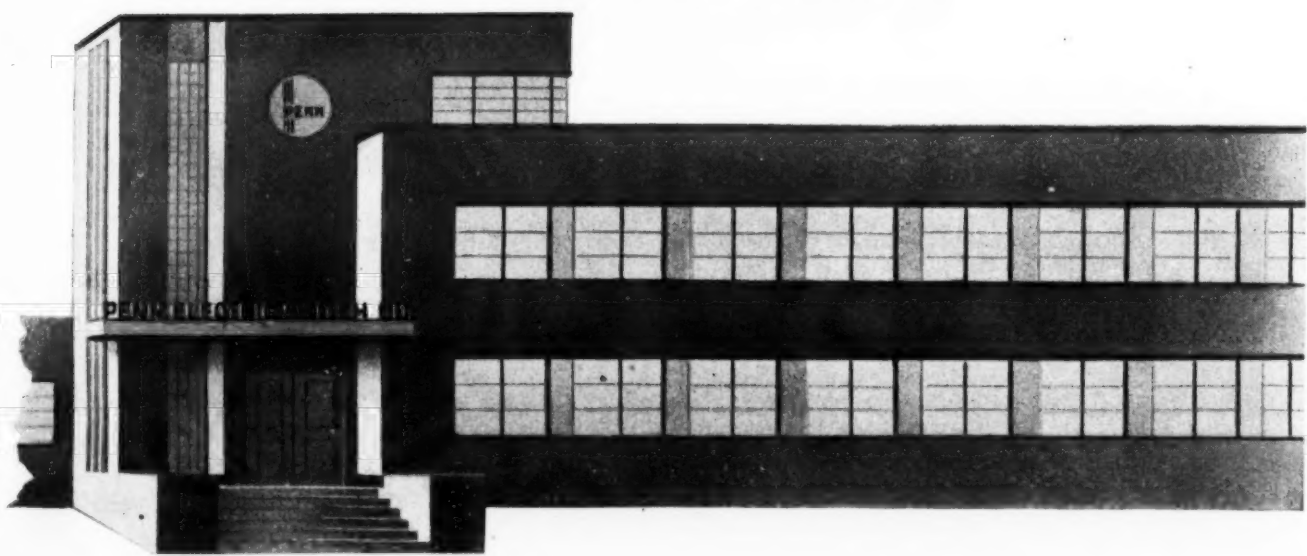
you have a refrigeration control problem, bring it to us as so many

others are doing and have been doing for years. PENN ELECTRIC

SWITCH CO., GOSHEN, INDIANA. In Canada: Powerlite Devices, Ltd.,

Penn Electric Switch Division, Toronto, Ont. Branches, representatives

and distributors in all principal cities.



DOING ONE THING WELL

DFN
SYSTEM

BOOTH 129

AT CHICAGO

DEHYDRATORS—FILTERS—NEUTRALIZERS—STRAINERS

MOISTURE DETECTORS

McINTIRE CONNECTOR COMPANY

NEWARK, N. J.

Exhibitors Promote Attendance For Big Show Opening Jan. 16

(Continued from Page 10, Column 5)
Ranco controls," said Mr. Vitis, "are directly to refrigerator manufacturers and refrigeration parts and supplies jobbers. Therefore, Ranco, Inc. would be anxious to see all engineers, sales managers, refrigeration parts and supply jobbers, independent service men, and all who are connected in the refrigeration industry attend the exhibition in January."

Refrigeration & Air Conditioning Institute

Included in the exhibit which Refrigeration & Air Conditioning Institute will have at the exhibition will be a special showing of two or three educational motion pictures on subjects of special interest to visitors, announces Ray D. Smith, president.

Facilities will be available to give aptitude tests to anyone who would be interested in his particular abilities in the various phases of air-conditioning and refrigeration work. Also, in poster fashion, the institute will illustrate the program of a student taking its training, and the thoroughness with which the training is given.

Highlight of the exhibit will be a miniature air-conditioned home, constructed so as to illustrate the principles of residential comfort conditioning. By special lighting effects it will be possible, with this display, to show the functions of an air-conditioning system, and to demonstrate the relation between the heating, cooling, and humidifying processes at various temperatures.

Refrigerating Specialties Co.

Refrigerating Specialties Co. plans to exhibit its line of automatics for cooling plants, but none for household electric refrigerators, according to Charles C. Hansen, Jr., secretary-treasurer. The company sells to manufacturers, distributors, dealers, contractors, and service men who work on refrigerating and ice-making machinery or air conditioning. Sales to jobbers are made upon request.

Riley Engineering Corp.

Riley Engineering Corp. will exhibit its complete line of 12 oil separators and high side floats, including some designs new to the trade, reports Frank B. Riley. Oil separators shown will range in capacity from 1/4 to 50 hp., allegedly representing the largest and smallest oil separators in the world.

New Riley products to be displayed include automatic and thermostatic expansion valves, constant pressure valves, snap-action valves, check valves, and two additional designs in appliances, the nature of which has not yet been revealed.

The company distributes its products entirely through manufacturers of compressor assemblies and through jobbers, having no other outlets of any kind except export, which is handled by a New York export representative.

Attendance at the exhibition will be encouraged by weekly mention of the show to all jobbers and refrigerating machine manufacturers contacted by the Riley organization.

Superior Valve & Fittings Co.

Representative samples of all of its refrigeration and air-conditioning products, including diaphragm packless valves, packed valves with seal caps, flare fittings with wrench flats, filters and strainers, check valves, liquid indicators, and the new mani-

fold of hard drawn copper tubing, will be exhibited by Superior Valve & Fittings Co. in its convention display, states J. S. Forbes, president.

The new manifold, Mr. Forbes explained, enables the jobber to take standard two-way valves from his stock and use them not only in the conventional manner but also to connect to the manifolds, thus giving him a broader usage of the valves.

The manifold is lower in overall height, Mr. Forbes continued, and the mounting flange on the valve takes the strain directly instead of the strain being on the threaded joint.

An interesting exhibit in the Superior display will be a check valve of a type described by Mr. Forbes as being non-chattering on balanced or almost balanced pressure. This valve is constructed so that if it is soldered into the line, the internal parts may be removed to prevent damage by heat distortion during the soldering, Mr. Forbes explained.

The design also will facilitate repairing without removing the valve body proper from the line, he added.

The Superior company is promoting attendance at the convention by correspondence and "word of mouth," this work being done by the firm's field men among prospective buyers.

Tecumseh Products Co.

First public showing of Tecumseh Products Co.'s 1 1/2 to 3-hp. compressors and also of its hermetic units will be held at the Chicago show, reports F. K. Smith, sales manager of the company's refrigeration division.

Built around these new products will be a display of conventional Tecumseh compressors and condensing units ranging in size from 1/4 to 3 hp. and of hermetic units ranging from 1/4 to 1 1/2 hp.

Sales of these products are at present restricted to manufacturers and jobbers of refrigeration parts and supplies, and the Tecumseh organization is interested in attracting both of these groups to the exhibition. To accomplish this end, the company is having its field representatives contact all customers and prospective customers.

The Texas Co.

The Texas Co. will sponsor a display of its Capella series of lubricating oils for refrigeration compressors, according to F. C. Kearns, but details of the display have not yet been worked out.

Van Cleef Bros.

Eight "Dutch Brand" products used in the refrigeration field will be featured in the exhibit of Van Cleef Bros., Chicago manufacturer of rubber and chemical products, F. M. Hagerty announced.

These Dutch Brand products are as follows: friction tape, rubber tape, soldering paste, "rub'r-shim," "gaskatex," general use oil, sponge rubber, and refrigerator gum.

The "rub'r-shim" is a sponge rubber strip for cushioning and sealing. "Gaskatex" is a gasket sealing paste.

"Our products are distributed solely through jobbing channels," said Mr. Hagerty, adding that Van Cleef Bros. will be glad to see buyers of dealer concerns and new jobbers at the show.

Victor Mfg. & Gasket Co.

Refrigeration gaskets, the materials from which they are made, the packages in which they are placed, the promotion through which they are sold, and the catalogs in which they are described and listed all will go to comprise the exhibit of Victor Mfg. & Gasket Co., reports Edward Gammie, industrial sales manager.

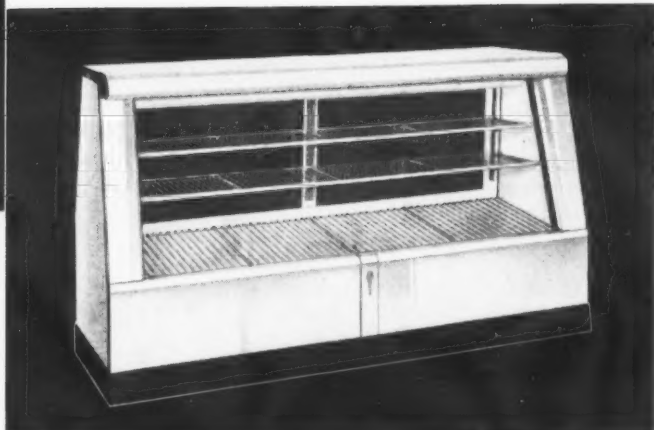
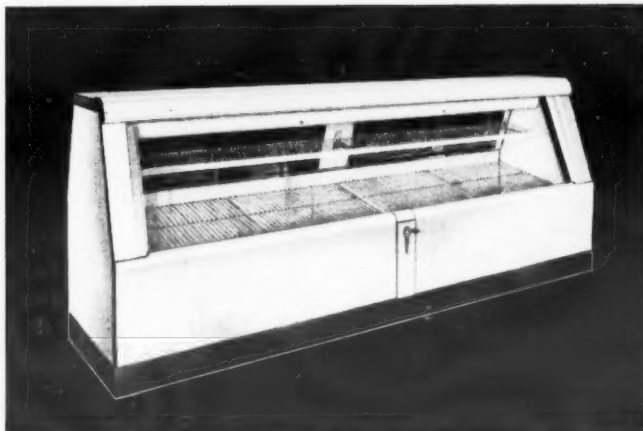
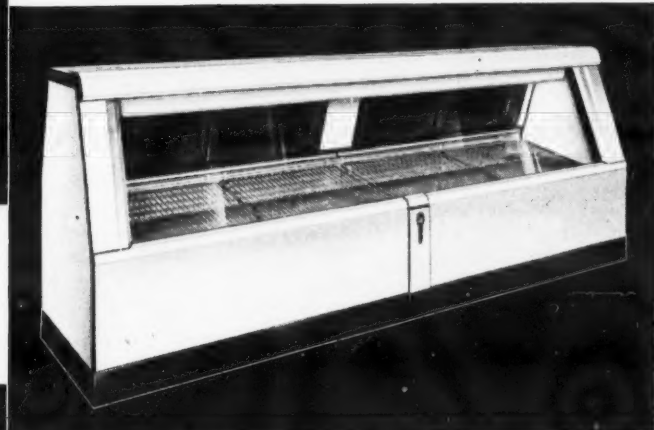
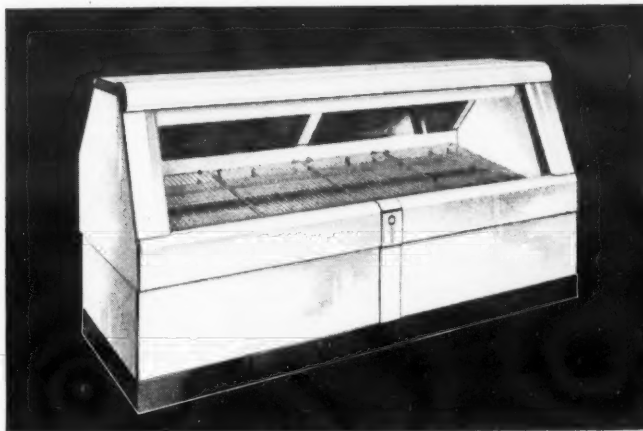
Latest refrigerator gasketing material (Concluded on Page 13, Column 1)

"in my case
a deciding factor"
**SEEGER MADE
ALL PORCELAIN**



Experienced buyers know there is no substitute for Seeger-made all-porcelain. In display case construction, it means dependability and economy through years of hard usage to which display cases are naturally subjected in the average busy market.

Seeger Display Cases are pieces of equipment which, from the standpoint of service and initial cost, are sound investments for the progressive merchant.

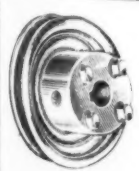


Seeger-made all-porcelain single and double duty Display Cases have the most modern construction details and features, many of which are exclusive with Seeger Cases only. Seeger patented non-fogging display glass fronts and sliding doors — Loc-i-tite sliding

doors fitted with roller bearings — Cork insulation and smart styling are among the features which are illustrated in full detail in the specification folder of each model. Sent promptly on request.

SEEGER REFRIGERATOR COMPANY
SAINT PAUL, MINNESOTA

NEW YORK BOSTON PHILADELPHIA CHICAGO LOS ANGELES



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BOOTH No. 133

Refrigeration and Air Conditioning
Accessories EXHIBITION

STEVENS HOTEL - January 16-19, 1939

MAUREY MANUFACTURING CORP.
2907-15 So. Wabash Ave. CHICAGO



A Statistical Review of the Refrigeration & Air Conditioning Industries

Field Covered By Survey

In this study the "Refrigeration and Air Conditioning Industries" are viewed in terms of household and commercial applications in the smaller sizes of equipment which are installed and operated in the home, office, store, or other points of use.

In other words, this data deals mainly with the sale of refrigerating units (usually operated automatically) to the public for use on the premises of the customer, also the sale of air-conditioning units in which cooling by refrigeration is an essential feature.

This phase of refrigeration had its beginnings only 25 years ago and its development into a major industry has taken place almost entirely within the past dozen years. In particular, the sale of millions of household electric refrigerators has been one of the phenomenal merchandizing feats of the depression period.

The sale of commercial refrigeration equipment has also had a rapid growth. During the past two or three years, self-contained and automatically-operated air-conditioning units have been sold in sufficient numbers to indicate that "packaged" air-conditioning equipment will probably follow the trail blazed by household and commercial refrigeration.

Number of Manufacturers

The great expansion of this phase of refrigeration and air conditioning is indicated by the fact that nearly one thousand different manufacturing companies are now engaged in producing complete units, or the various component parts, supplies, materials, and accessories which go to make up the complete refrigeration and air-conditioning units.

One may gain a general idea of the refrigerating and air-conditioning industries and its various divisions and subdivisions by noting the manner in which products are classified in the *Refrigeration & Air Conditioning Directory* which lists all manufacturers by classification of products.

The 1938 edition of this *Directory* is divided into four product sections as follows:

- (1) Air Conditioning Systems and Equipment.
- (2) Commercial Refrigeration and Equipment.
- (3) Household Refrigeration and Equipment.
- (4) Parts, Materials, Supplies and Accessories.

A total of 934 manufacturers are listed but the names of many large companies appear in two or more sections.

Air Conditioning

A total of 493 companies are listed as manufacturers of Air Conditioning Systems and Equipment. Only 31 of these are making complete "All-year-round" central systems (in which the principal component parts are remotely installed and the conditioned air is distributed through ducts to the conditioned space) or "All-year-round" unitary systems (in which two or more component parts are combined in units and installed in or near the space to be conditioned). Localized air distribution represents the basic feature of unitary systems. Other companies make only "summer air conditioning" or "comfort cooling" equipment.

There are 99 companies which specialize in condensing units and heat-transfer equipment, while 107 are listed under air-moving, filtering, washing and cooling equipment. Others make insulation, grilles, controls, fittings, etc.

Commercial Refrigeration

A total of 669 companies are listed under Commercial Refrigeration and Equipment. Of this number, only 23 sell complete commercial systems, while 59 make display, walk-in and reach-in refrigerators and cabinets. The others make a great variety of equipment for special applications, such as dairy, ice cream, and soda fountain equipment (74 companies), refrigerated truck bodies (54 com-

panies), water and beverage coolers (80 companies). Others make controls, motors, or other parts and supplies.

Household Refrigeration

A total of 293 concerns are listed as manufacturers of Household Refrigeration and Equipment (operated by electricity, gas, kerosene, or ice). This classification includes cabinets, condensing and cooling units, controls, and accessories. Only 33 companies are listed as manufacturers of complete electric refrigerators (less than a dozen of these doing a large proportion of the business).

Two manufacturers of gas refrigerators are listed but only one of these (Electrolux) is now in business. Three are listed under kerosene refrigerators but only two are operating. Eleven manufacturers of ice refrigerators are listed.

Parts and Supplies

There are 652 concerns listed as manufacturers of Parts, Materials, Supplies and Accessories. In addition to all of the parts which go into the refrigerating machine (or condensing unit) and the cooling coils, there are a large number of companies making equipment and tools for installation, testing and service. This section also includes the manufacturers of raw and fabricated materials such as tubing, solder, rubber parts, porcelain enamel, lubricants, and numerous others.

The growth of the business of supplying Parts, Materials, Supplies and Accessories especially designed for refrigeration and air conditioning use has been a most important factor in the expansion of the industry and the satisfactory service of the equipment.

In brief, many other industries have made substantial contributions to refrigeration and air conditioning by supplying a multitude of small items which had been developed out of the experience gained in other fields.

Conversely, it is fair to say that the rigid specifications required for satisfactory performance in a machine which must operate automatically without an attendant, have been responsible for important refinements in a large number of products.

Sales Statistics on Household Refrigerators

All available statistics on the sales of household and commercial refrigeration and air-conditioning equipment, as collected and released by the various associations, are officially published in *AIR CONDITIONING & REFRIGERATION NEWS*. For many years the *NEWS* has also made estimates of the total industry sales of household electric refrigerators.

The growth of the household electric refrigeration business is shown by the following tabulation of world sales by all U. S. manufacturers since the beginning of the industry,

Household Electric Refrigerator Sales

Estimated World Sales by All U. S. Manufacturers

Year	No. of Units	Average Retail Price	Retail Value
Up to 1920	10,000	\$600	\$ 6,000,000
1921	5,000	550	2,750,000
1922	12,000	525	6,300,000
1923	18,000	475	8,550,000
1924	30,000	450	13,500,000
1925	75,000	425	31,875,000
1926	210,000	390	81,900,000
1927	390,000	350	136,500,000
1928	560,000	334	187,040,000
1929	840,000	292	245,280,000
1930	850,000	275	233,750,000
1931	965,000	258	248,970,000
1932	840,000	195	163,800,000
1933	1,080,000	170	183,600,000
1934	1,390,000	172	239,080,000
1935	1,688,000	166	280,208,000
1936	2,180,000	164	357,520,000
1937	2,500,000	171	427,500,000
1938 (8 mos.)	1,050,000	172	180,600,000

5-Year Cumulative Record of Electric Refrigerator World Sales, Exports, Retirements and Market Saturation

	World Sales	Exports	Sales In U.S.	Retirements	Distributor & Dealer Stocks	Total In Use In U.S.	Wired Homes	Market Saturation
Dec. 31, 1933	5,885,000	356,000	5,529,000	800,000	75,000	4,654,000	19,844,000	23.4%
During 1934	1,390,000	107,000	1,283,000	63,000				
Dec. 31, 1934	7,275,000	463,000	6,812,000	863,000	125,000	5,824,000	20,694,000	28.1%
During 1935	1,688,000	120,000	1,568,000	114,000				
Dec. 31, 1935	8,963,000	583,000	8,380,000	977,000	125,000	7,278,000	21,204,000	34.3%
During 1936	2,180,000	184,000	1,996,000	225,000				
Dec. 31, 1936	11,143,000	767,000	10,376,000	1,202,000	200,000	8,974,000	21,888,000	41.0%
During 1937	2,500,000	190,000	2,310,000	358,000				
Dec. 31, 1937	13,643,000	957,000	12,686,000	1,560,000	300,000	10,826,000	22,800,000	47.5%

Household Electric Refrigerator Sales (U. S. Only) By Sizes, Reported By 14 Manufacturers In Nema Group

Lacquer	1935	1936	1937
1. Chest	22,939	12,897	7,450
2. Less than 3 cu. ft.....	1,576	1,583	226
3. 3 to 3.99 cu. ft.....	56,552	50,526	58,158
4. 4 to 4.99 cu. ft.....	309,071	271,290	290,025
5. 5 to 5.99 cu. ft.....	325,453	469,035	536,438
6. 6 to 6.99 cu. ft.....	207,192	560,287	758,730
7. 7 to 7.99 cu. ft.....	103,954	149,736	192,904
8. 8 to 9.99 cu. ft.....	23,970	29,523	66,098
9. 10 to 12.99 cu. ft.....	411	237	928
10. 13 cu. ft. and up.....	47	40	34
11. Total Lacquer	1,051,165	1,545,154	1,900,991
Porcelain			
12. Up to 4.99 cu. ft.....	14,253	12,882	4,912
13. 5 to 5.99 cu. ft.....	51,196	66,699	58,030
14. 6 to 6.99 cu. ft.....	61,320	122,366	130,014
15. 7 to 7.99 cu. ft.....	48,864	54,809	45,183
16. 8 to 9.99 cu. ft.....	21,487	30,452	32,094
17. 10 to 12.99 cu. ft.....	5,914	4,442	3,444
18. 13 cu. ft. and up.....	2,442	3,119	6,236
19. Total Porcelain	205,576	294,769	279,913
20. Total Porcelain and Lacquer....	1,256,741	1,839,923	2,180,904

as estimated by *AIR CONDITIONING & REFRIGERATION NEWS*.

During recent years these figures have been based upon sales reported by 14 leading manufacturers who are members of the Refrigeration Division of National Electrical Manufacturers Association (Nema).

The sales of this group now represent nearly 95% of all U. S. manufacturers.

Average Retail Price

It will be noted in the tabulation shown below that the trend of the average retail price was steadily downward until 1936. Since then there has been a slight upward tendency and the indications are that

1939 prices will be still higher due to a variety of conditions.

Another indication of the trend in electric refrigerator sales is shown by the tabulation (see above) in which sales are broken down according to the size of the cabinets (measured in terms of food storage capacity) for each of the two types of exterior finish (lacquer or porcelain).

Average Size

It will be noted that, during the years 1935-6-7, there has been a decline in the popularity of the small chest models which were originally designed to meet the demand for low price units in the Tennessee Valley experiments of the U. S. government.

There has also been a decline in the demand for models of less than 4-cu. ft. capacity along with an increase in the 5-cu. ft. models and a still larger increase in the 6 and 7-cu. ft. capacity models.

These figures include only sales of complete self-contained units in the United States by the 14 principal companies included in the Nema group.

Market Saturation

Also shown on this page is a tabulation showing a Five-Year Cumulative Record of Household Electric Refrigerator World Sales, Exports, Retirements, and Market Saturation of U. S. Wired Homes.

At the end of 1937 a total of 13,643,000 units had been sold by manufacturers to their distributors. Of this number 957,000 were exported to foreign countries, leaving a total of 12,686,000 sales in the United States. The *NEWS* estimates that 1,560,000 units had been retired (or junked). A large portion of this number is accounted for by the replacement of old style "multiple systems" which were installed in

apartment buildings on a large scale during the early years.

Allowing 300,000 units for unsold stock in the hands of distributors at the end of 1937, the *NEWS* estimated that a total of 10,826,000 were still in use in the 22,800,000 wired homes.

Thus, the market saturation was estimated to be 47.5%. This estimate has been confirmed by various surveys which have been made in large and small cities in different parts of the country. In general, the saturation is higher in the larger cities and in communities having a relatively high per capita income. The saturation is lower in the small towns and in areas of low average income.

Sales By States

For example, there were 10 states, each of which accounted for 3% or more of the total sales of household electric refrigerators during the first eight months of 1938. The states in order of their rank were as follows:

1938 (8 Months Only)

Sales By States

Reported by 17 Companies

State	No. of Units	%
1. New York ...	132,902	12.9
2. Pennsylvania ...	92,273	9.0
3. Illinois ...	88,270	8.6
4. California ...	72,268	7.0
5. Ohio ...	55,487	5.4
6. Texas ...	49,647	4.8
7. Michigan ...	43,838	4.3
8. Massachusetts ...	40,771	4.0
9. New Jersey ...	39,636	3.9
10. Missouri ...	30,649	3.0
11. Minnesota ...	27,081	2.6
12. Indiana ...	24,884	2.4
13. Wisconsin ...	22,058	2.1
14. Iowa ...	19,929	2.0
15. North Carolina ...	18,775	1.8
16. Washington ...	17,375	1.7
17. Tennessee ...	15,430	1.5
18. Virginia ...	15,261	1.5
19. Connecticut ...	14,315	1.4
20. Louisiana ...	13,836	1.3
21. Maryland ...	13,170	1.3
22. Georgia ...	13,100	1.3
23. Kentucky ...	12,787	1.3
24. Dist. Columbia ...	12,582	1.2
25. Oklahoma ...	12,079	1.2
26. Kansas ...	12,012	1.2
27. Florida ...	11,568	1.1
28. West Virginia ...	9,681	.9
29. Alabama ...	9,503	.9
30. Oregon ...	8,706	.8
31. Nebraska ...	8,328	.8
32. South Carolina ...	7,960	.8
33. Colorado ...	7,889	.8
34. Arkansas ...	6,149	.6
35. Utah ...	5,996	.6
36. Mississippi ...	5,316	.5
37. Maine ...	4,852	.5
38. Rhode Island ...	4,066	.4
39. Idaho ...	3,862	.4
40. New Hampshire ...	2,988	.3
41. Montana ...	2,984	.3
42. Arizona ...	2,656	.3
43. Vermont ...	2,638	.3
44. South Dakota ...	2,567	.3
45. North Dakota ...	2,419	.2
46. Delaware ...	2,084	.2
47. New Mexico ...	2,052	.2
48. Nevada ...	1,171	.1
49. Wyoming ...	1,388	.1
Totals	1,027,236	100.0%

(Concluded on Page 14, Column 1)

New Products Included In Plans For Exhibits At Stevens Hotel

(Concluded from Page 11, Column 2)
rials, such as Victor Asbestoprene, which is asbestos millboard saturated with a synthetic rubber compound, and also the latest compressed asbestos materials with neoprene binders, will be included in the display. The company sells its products to original manufacturers, with replacement gaskets being sold through recognized jobbers. By circularizing the trade, the company plans to promote attendance at the show.

Wolverine Tube Co.

Copper tube and wrought fittings will comprise the display of Wolverine Tube Co., J. D. Colyer, vice president, reports. This firm distributes its products through jobbers and directly to manufacturers, and would like to have this part of the trade, as well as service men and engineers, attend the exhibition.

Zenith Carburetor Division

The "Sight-Feed" filter assembly, recent addition to the line of Zenith Carburetor division of Bendix Aviation Corp., will be featured in the Zenith display of refrigerant filters, announces M. Ben Heftler, filter engineer. Zenith's new sight-feed filter assembly, Mr. Heftler explained, is a combination of the regular filter and the sight glass, but the two parts are combined so that the accumulation of dirt on the filter element is readily visible without interfering in any way with the convenience of the unit for observing the inclusion of gas in the liquid line. The regular Zenith filter assemblies are designed for use in the liquid line of compressor type machines from domestic sizes up to and including 20-hp. commercial sizes, said Mr. Heftler. Zenith products are now distributed through refrigeration job-

bers in all parts of the country and in Canada, and also are sold directly to manufacturers.

Henry Valve Co.

A general product display is planned by Henry Valve Co., according to C. V. Gary, sales manager. The display may contain a few new items, but the nature of these has not yet been announced. The company depends almost entirely upon jobbers for distribution of its products, but would like to have all potential customers, including consumers, service men, dealers, distributors, contractors, architects and engineering consultants, manufacturers of condensing units, display cases, and other refrigeration equipment, as well as jobbers, attend the exhibition.

In order to help promote attendance, the company has instructed its factory representatives to secure names of interested personnel in various sections of the country where prospects appeared on the list furnished by the exhibit committee. The company hopes to have all of its factory representatives present at the show.

Wagner Electric Co.

Fan motors varying in capacity from approximately $\frac{1}{100}$ to $\frac{1}{40}$ hp., both round frame and rubber mounted, for application to air-conditioning systems for blower drives, as well as capacitor, repulsion-induction, and squirrel-cage motors, such as used for driving refrigeration compressors, will be displayed by Wagner Electric Co., reports E. O. Kreuger of the firm's Chicago office.

Current developments in the method of rubber mounting motors and protecting them from overload by means of thermal cutouts also will be shown.

At present, sales of the company's products are confined largely to manufacturers of domestic and commercial refrigeration equipment, as well as other manufacturers of motor-driven machines, such as pumps, air compressors, etc. The firm also sells a considerable volume of equipment direct to large industrial users and to dealers and distributors.

Gas Appliance Man Says Specialty Dealers' Effort Made Electric Ranges a Threat

(Concluded from Page 1, Column 1)
formance" gas ranges also announced at the meeting that they have adopted a national sales promotion campaign for 1939, details of which will be worked out during the next few months.

Sounding a call for both gas utilities and manufacturers to become more retail-dealer minded as their one big chance of obtaining a greater share of the household appliance business, Mr. Davis said: "There are definitely two distinct types of retail appliance dealers. One group is the 'basement appliance dealers,' consisting of plumbers and heating appliance dealers. They definitely are an asset to our industry, because of their ability to sell water heating and house-heating equipment. . . .

'LOAD IS DECLINING'

"But the other group of dealers, made up of department, furniture, and hardware stores, radio and specialty appliance dealers, is the group that so materially affects our important kitchen load, and with whom we have not fared so well.

"We all recognize and are concerned with the fact that our domestic load is declining, and that the ratio of gas range to electric-range sales has decreased from 10 gas-range sales to one electric-range sale in 1933 to as little as four gas-range sales to one electric in the last year.

"While we consider electric ranges to be still in the promotional stage, over one half of the electric ranges sold last year were sold by dealers. In other words, here we talk about the 16 million customers now cooking with gas, and admit and boast that ours is the ideal and accepted fuel, yet we have dealers selling no greater percentage of our heat-controlled ranges than they are selling fully equipped electric ranges during the infant stage of public acceptance of that appliance.

"A recent survey discloses that, out of 19,000 department stores and appliance dealers, exclusive of plumb-

ing and heating contractors, 13,000 of them are now handling electric ranges. This shows how our competitors have taken advantage of sales opportunities offered by this class of dealer outlets.

"What will this vast army of dealers do to us at their present rate of progress with electric equipment, especially ranges and refrigerators, if and when electric ranges should gain public acceptance?

"Maybe I can show you by taking the case of automatic refrigerators, which we all admit now have that so-called public acceptance. For instance, last year such dealers sold about 1,600,000 electric refrigerators. In other words, in 12 months dealers opened the doors of a vast number of American homes to the acceptance of mechanical refrigerators, a great part of which would have been gas refrigerators—if this last mentioned class of dealers had been sold upon the superiority of gas refrigeration by our aggressive sales promotion and sales training.

"Need I go further to show you the value of this group of dealers to us, if they were enlisted as our allies? Need I go further to show you what these dealers could do to bolster our range sales, if they were enlisted to our cause? Need I go further to warn you of the harm they can and will do if we compete with them, or fail to educate them and extend to them equal cooperation?

"These aggressive merchandisers, with whom I say we are not fully cooperating, are of a type such as have banded together into trade groups and associations with whom we have never entered into any kind of cooperative agreements.

"These electric type of kitchen appliance sales were made by the class of dealer who maintains his own sales floor, sales force, newspaper advertising, buys his own stock, sells it, delivers it, installs it, finances it, collects for it, and services it.

"It's the type of dealer who could

do exactly the same thing with gas appliances, but during the last seven years we have sorely neglected him with sales training and sales cooperation, while we have been earnestly trying to force plumbing and heating contractors into that kitchen appliance market for which they have not qualified.

"People buy ranges and refrigerators, like other beautiful upstairs home furnishings, by shopping around among home furnishers and merchandisers—viewing merchandise displayed in beautiful settings—probably in response to striking newspaper advertising and neat, courteous, and capable salesmanship, of the type which would be highly impractical in a plumbing and heating shop.

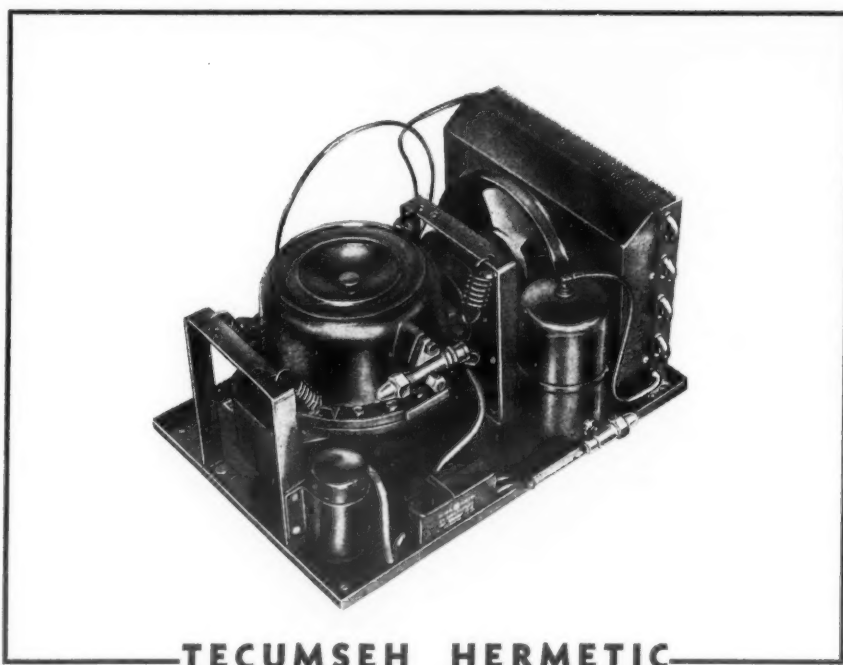
"Someone says, 'yes, but I can't get such dealers to cooperate—they want too much and are too electric-minded.' In answer to that, I say to you we had better give them as much or more than our competitors have given them, and finally I say that if we can't sell these people and their employees—nearly 50,000 such business establishments—then we shouldn't expect to be able to sell anyone else.

SHOULD APPROACH DEALERS

"Whatever the reasonable cost may be to approach the 'kitchen appliance dealer group,' it should be well worth while, when one considers that, on the surface, here appears to be an opportunity to switch over one half of the electric-range sales to gas-range sales, and an opportunity to open a market for upward of 1,600,000 more gas refrigerators per year.

"We know that electric-equipment manufacturers have bettered our gas-equipment manufacturers in national promotion schemes and in establishing dealer contacts, franchises, and training programs. For that very reason, I believe electric utilities have become more conscious and appreciative of the value of such dealers than have gas utilities.

"To offset this condition, I believe that all our manufacturers of gas appliances, and every gas company sales manager and official, should join forces and become even more dealer conscious than our competitors. . . ."



Chieftain Facts

PAST

1. Started in 1933 with single cylinder compressor
2. Produced in 1933—10,000 compressors
3. Our policy "Customer's success is our success"

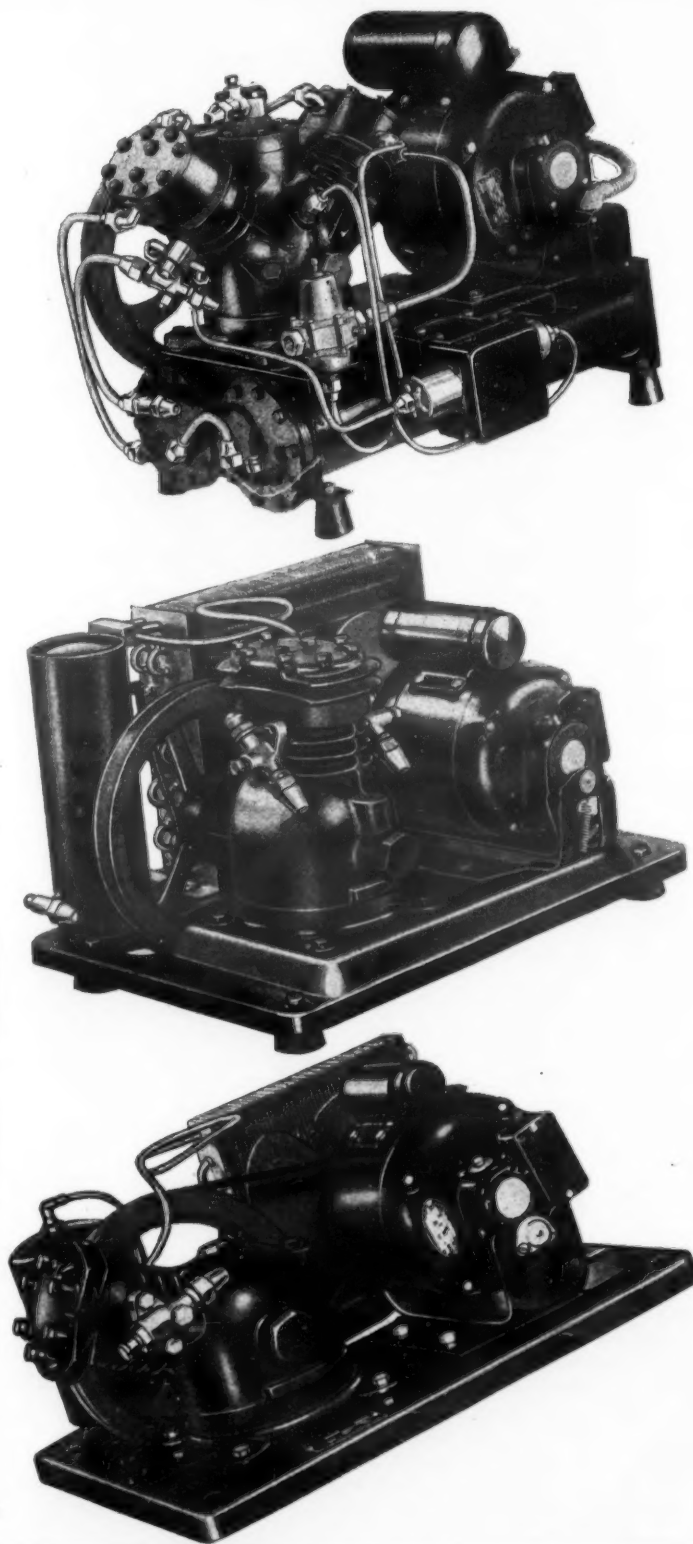
PRESENT

1. Have 500,000 satisfied users
2. Supply 98 models of condensing units
3. Producing over 150,000 units per year
4. Our policy "Customer's success is our success"

FUTURE

1. Ask about the "Tecumseh Hermetic"
2. Ask about our new "Big Four"
3. Our policy "Customer's success is our success"

TECUMSEH PRODUCTS CO. TECUMSEH, MICH.



Commercial Refrigeration & Air Conditioning

(Continued from Page 12)

It is more difficult to arrive at an accurate estimate of the sales of Commercial Refrigeration and Air-Conditioning Equipment since there are several groups of manufacturers which supply portions of these systems and in some cases it is impossible to identify the final application of certain component parts.

The following tabulation shows the sales to distributors of commercial refrigeration and air-conditioning units by 14 of the principal manufacturers whose sales statistics are collected by the Refrigeration Division of National Electrical Manufacturers Association (Nema).

It will be noted that water coolers are sold as complete units in two principal types (bottle and pressure) and that water coolers are also sold with the "low-side" or cooling unit only. This means that the refrigerating machine (or condensing unit) is sold and installed separately. The same applies to ice cream cabinets, milk cooling cabinets, and air-conditioning units.

The sales of refrigerating machines (or condensing units) which were sold separately in sizes ranging from less than 1/2 hp. up to 50 hp. are broken down according to size but the final application of these machines is not recorded.

The total sales of this group amounted to \$29,163,349 in 1936 and \$37,433,505 in 1937. These figures are based upon factory prices and do not include distributors and dealers margins or cost of installation.

In addition to this tabulation of sales, it would be necessary to have the sales of commercial refrigeration cabinets and display cases and numerous special designs which are made by a large number of other manufacturers, in order to arrive at the total volume of business in the commercial and air-conditioning field.

In the commercial refrigeration field particularly, there are two well-defined groups of manufacturers. First, those who make the refrigerating machines and second, those who specialize in cabinets and display cases. In the sale of commercial equipment, the machine manufacturers usually cooperate with the case manufacturers, to sell the entire installation.

Significant Developments During Recent Years

With the growth and expansion of the Household and Commercial Refrigeration business during the past dozen years and the more recent addition of Air Conditioning as a major application for refrigerating equipment, there have been a number of significant changes in the methods of marketing these products.

The number of dealers of all types handling electric refrigerators has grown to a very large total. Many types of retailers—department stores, public utilities, furniture stores, hardware dealers, automotive dealers, even small-town implement dealers and general stores are selling this merchandise. The greatest volume sold by any single group, however, remains in the hands of the electrical appliance dealers.

Companion Appliances

The larger refrigerator manufacturers have developed, or are developing, companion lines for their dealer outlets. These include particularly electric washing and ironing machines, electric ranges, and water heaters.

Types of products most in demand as companion appliances include room coolers, oil burners, oil-fired room heaters, coal stokers, and water softeners. Traffic appliances, such as lamps, irons, toasters, and food mixers, have been added with success by electric refrigeration sales organizations.

Replacements & Trade-Ins

Now that the remaining unsold market for household refrigerators consists mainly of homes in the lower income brackets, dealers are giving more attention to the replacement market. The figures indicate that there are now about one million units in use which are over 10 years old. In the next five years four million

1937 Commercial Refrigeration and Air Conditioning Units—Total World Sales By 14 Companies In Nema Group

1937	Quantity	Value
1. Bottle Water Coolers—Complete.....	8,852	\$ 571,925
2. Pressure Water Coolers—Complete.....	26,939	2,641,142
3. Water Coolers—Low Side Only.....	2,054	144,189
4. Ice Cream Cabinets—Complete.....	33,035	4,969,845
5. Ice Cream Holding Cabinets Only (Remote)....	4,800	645,625
6. Bottled Beverage Coolers—Complete.....	38,622	3,364,450
7. Milk Cooling Cabinets (No High Sides).....	1,892	127,754
8. Air Conditioners—Self-Contained.....	10,354	2,268,126
9. Air Conditioners—Floor Type (No High Sides)...	3,662	1,417,055
10. Air Conditioners—Ceiling (Cooling Only—No High Sides).....	3,699	608,604
11. Air Conditioners—Ceiling Type (Equipped for Heating—No High Sides).....	808	431,997
12. Air Conditioners—Residential Type (No High Sides, Boilers, or Furnaces).....	554	202,355
13. Condensing Units Less Than 1/2 Hp.....	36,679	2,034,566
14. Condensing Units—1/2 Hp.....	34,965	2,705,389
15. Condensing Units—1/2 Hp.....	20,416	2,099,946
16. Condensing Units—3/4 Hp.....	13,178	1,804,000
17. Condensing Units—1 Hp.....	9,757	1,551,642
18. Condensing Units—1 1/2 Hp.....	5,721	1,147,889
19. Condensing Units—2 Hp.....	3,991	693,802
20. Condensing Units—3 Hp.....	2,688	770,980
21. Condensing Units—5 Hp.....	1,763	721,134
22. Condensing Units—7 1/2 Hp.....	843	542,257
23. Condensing Units—10 Hp.....	931	722,272
24. Condensing Units—15 Hp.....	836	753,328
25. Condensing Units—20 Hp.....	520	597,439
26. Condensing Units—25 Hp.....	357	479,202
27. Condensing Units—30 Hp.....	173	263,416
28. Condensing Units—40 Hp.....	274	488,380
29. Condensing Units—50 Hp.....	70	136,300
30. Total Lines 13 to 29, Inclusive.....	133,163	17,511,942
31. Total—Lines 1, 2, 4, 6, 8, and 30.....	250,964
32. Commercial Evaporators (Not Reported Above)...	54,095	1,683,865
33. Air Conditioning Evaporators (Not Rept. Above)...	3,121	844,631
34. Total Commercial and Air Conditioning.....	\$37,433,505

more units will have attained that age. In the following three years another four million will be added, and in two more years after that four million will be added again.

In 1937 it was estimated that about 15% of the household sales were replacements of old units. In 1938 the replacement sales may run as high as 20%.

Trade-ins are now becoming an important factor in household refrigerator sales. There is an active market for used equipment. A fairly large percentage of old units is now being reconditioned and again put into service. Apparently, the lowest-income families will eventually be supplied in this manner, as in the automobile field.

A recent survey of 1,500 sales made by three large dealers in Detroit showed that many families buy a new refrigerator without trading in the old. They move the old unit to the basement or summer home, sell it, or give it away.

Increased Number of Parts & Supplies Jobbers

The manufacturers of parts, materials and supplies have now become a well-defined division of the industry. The leading companies in this field have formed the Refrigeration Supplies & Parts Manufacturers' Association which is sponsoring the "First All-Industry Refrigeration and Air Conditioning Exhibition" which will be held in Chicago in January, 1939.

Another well-defined group which has become an important factor in the industry during the past few years consists of refrigeration supply jobbers who specialize in the replacement parts and supplies which are used by installation contractors, industrial users, and service companies. The manufacturers of parts and supplies, therefore, have two main outlets for their products. First, the manufacturers of original equipment who are large quantity buyers and second, the refrigeration supply jobbers who are accounting for a rapidly increasing volume of business.

A sidelight on the growth of the industry and the confidence in its future is shown by the large number of students who are studying refrigeration and air conditioning. Many public schools and colleges are now offering courses in these subjects.

Two or three institutes offering home-study courses have large enrollments. Laboratory and shop training are given at the end of the course. Many other schools have entered this field but most of them are poorly equipped.

Big Export Market

The export market has become a big factor in the sale of refrigeration products. American made controls, valves, and various fittings are in great demand in the world markets because of the high quality and quantity production of these items and the relatively low cost of transportation.

Household refrigerators made in America are by far the most popular in the world markets, especially in South America, South Africa, the Near East, and those parts of Europe which do not have prohibitory import regulations. Long-term guarantees offered by American manufacturers are an important factor in the pre-emption of many foreign markets.

There is a strong demand for kerosene-operated refrigerators in many foreign countries, particularly Australia.

Commercial refrigeration is becoming very popular in all the civilized countries of the world. Coils and cabinets are frequently built abroad, but foreign markets depend to a large extent upon American producers for complete condensing units. Air Conditioning has a big field, particularly in the tropical countries where American and European business men have always found it difficult to live because of the excessive heat and humidity.

Bottle Coolers Popular

One of the most active divisions of commercial refrigeration during 1938 was that of bottle coolers. Largely induced by a drive on the part of the Coca Cola company to secure distribution through filling stations, refrigerated bottle storage cabinets have been sold in great quantities this season.

This movement has spread to the equipping of roadside stands, barbecues, small restaurants, and food retailers in outlying districts. It is predicted that, owing to the relatively low saturation of this big market, it will afford considerable new business for several years to come.

Quick-frozen Foods

Quick freezing first came to public attention toward the end of the Great Boom in '29, and was greeted with great acclaim. Depression days hindered its progress, however, and not until recently has it developed into an industry.

Because of the exceedingly rapid chilling of foods effected by patented low-temperature equipment, the cellular structure of quick-frozen foods remains intact during the freezing; hence all the flavors and properties of such foods are retained until such time as they are to be used by the consumer.

Large producers, such as General Foods (Birds-Eye) now carry their freezing equipment right to the fields for processing fruits and vegetables, to the seashore for fish, and to their own abattoirs for meats. As a result, housewives are able to obtain the highest quality of every kind of food at any time of the year, and for prices not much above the market levels.

Largely because of transportation difficulties, distribution thus far has been limited to the eastern section of the United States. Improvements in truck refrigeration, however, are now permitting the gradual extension of this service to wider areas.

Because of the low temperatures involved in the storage of quick-frozen foods, a whole new science of low-temperature display and storage case and machine design has had to be evolved. This is a market which is just beginning to develop, and which offers great potentialities for future expansion.

Refrigerated Storage Lockers

An important development which points to the expansion of the farm market for refrigeration, is the recent popularity of refrigerated locker systems. Independent operators, and in some cases cooperative organizations, are rapidly installing locker plants in the smaller cities, particularly in the Middle Western states.

This new development brings cold storage and food processing facilities to small towns and rural communi-

ties, which formerly have had to be content with a limited diet.

The popularity of this service indicates that the more prosperous farmers will soon become active buyers for fairly large installations of cold storage and quick-freezing systems.

Rural Refrigeration

For use on farms not served by electricity, kerosene-operated and gasoline-engine-driven refrigerators have been having an extensive sale during the past few years.

Milk coolers also have been in strong demand, especially in view of the fact that state legislation has been upping the requirements for milk handling on dairy farms.

Associations & Societies

Refrigeration Division, National Electrical Manufacturers Association
155 E. 44th St., New York, N. Y.
Bruce Fleming, secretary.

Refrigeration Supplies & Parts Manufacturers Association
111 W. Washington St., Chicago, Ill.
R. M. McClure, executive secretary.

Air Conditioner Manufacturers' Association
Southern Building, Washington, D. C.
W. B. Henderson, executive secretary.

Refrigerating Machinery Association
Southern Building, Washington, D. C.
W. B. Henderson, executive secretary.

Commercial Refrigeration Manufacturers Association
111 W. Washington St., Chicago, Ill.
P. W. Sullivan, executive secretary.

National Refrigeration Supply Jobbers Association
111 W. Washington St., Chicago, Ill.
Sam Bush, executive secretary.

American Society of Refrigerating Engineers
37 W. 39th St., New York, N. Y.
David L. Fiske, secretary.

American Society of Heating & Ventilating Engineers
51 Madison Ave., New York, N. Y.
A. V. Hutchinson, secretary.

Refrigeration Service Engineers Society
433 N. Waller Ave., Chicago, Ill.
H. T. McDermott, secretary.

Household Refrigerator Sales By States

(This Tabulation Includes Only the Sales Reported by Manufacturers in the Nema Group)

	1932	1933	1934	1935	1936	1937
Alabama.....	3,990	7,827	14,283	22,320	21,348	24,047
Arizona.....	1,228	1,935	3,526	5,373	5,674	7,628
Arkansas.....	2,502	4,440	7,885	9,420	10,835	11,903
California.....	29,506	40,301	58,476	114,923	153,608	148,271
Colorado.....	4,580	6,934	8,969	11,416	14,002	14,239
Connecticut.....	12,938	14,216	15,851	22,536	32,049	41,482
Delaware.....	1,622	1,873	2,599	3,150	3,607	4,991
Dist. of Columbia.....	*	*	10,813	11,262	17,856	18,744
Florida.....	5,719	8,458	14,293	26,007	28,341	29,616
Georgia.....	5,735	10,662	24,777	27,034	31,006	35,741
Idaho.....	1,270	1,847	3,756	6,676	8,743	9,949
Illinois.....	46,059	57,943	91,545	107,672	138,631	171,464
Indiana.....	11,082	18,266	29,981	36,844	53,305	61,766
Iowa.....	7,452	11,209	17,414	23,217	27,559	32,712
Kansas.....	5,986	9,716	18,862	18,343	22,008	23,410
Kentucky.....	6,502	11,740	16,737	16,958	25,220	28,883
Louisiana.....	3,586	6,070	8,442	14,260	18,754	21,606
Maine.....	4,053	4,480	5,942	7,247	6,793	8,486
Maryland.....	33,948	30,918	21,732	20,794	21,189	27,744
Massachusetts.....	27,436	41,147	44,151	60,943	74,191	92,441
Michigan.....	20,513	26,162	45,636	63,644	97,078	116,763
Minnesota.....	11,136	11,951	15,087	20,854	26,674	40,025
Mississippi.....	1,463	2,660	4,372	6,728	10,364	10,794
Missouri.....	20,796	31,612	45,319	43,944	59,068	60,422
Montana.....	1,310	2,821	4,433	5,983	8,378	8,198
Nebraska.....	4,812	6,824	12,186	15,877	16,577	16,410
Nevada.....	667	996	1,102	1,834	2,484	2,606
New Hampshire.....	2,326	3,068	4,122	5,284	6,021	6,557
New Jersey.....	33,948	40,134	50,513	64,013	81,798	90,242
New Mexico.....	705	1,406	2,163	3,129	3,601	4,441
New York.....	148,299	163,004	160,539	178,659	222,327	263,887
North Carolina.....	5,184	12,081	17,584	24,306	34,226	44,298
North Dakota.....	1,196	1,499	2,715	3,825	3,096	4,048
Ohio.....	30,755	55,434	76,979	90,331	124,616	159,007
Oklahoma.....	6,714	10,099	15,170	16,279	18,936	21,504
Oregon.....	3,928	5,992	13,152	14,090	20,649	16,671
Pennsylvania.....	55,809	82,864	108,802	117,982	172,092	210,397
Rhode Island.....	5,752	7,290	6,756	7,459	9,618	12,351
South Carolina.....	2,555	5,270	8,434	12,385	16,684	20,971
South Dakota.....	1,033	2,026	3,665	4,878	4,780	4,588
Tennessee.....	5,810	7,827	22,861	23,804	29,136	33,762
Texas.....	16,131	29,954	45,764	60,350	75,610	87,649
Utah.....	2,388	3,556	5,057	6,932	10,890	11,595
Vermont.....	1,751	2,063	2,609	3,233	4,172	5,680
Virginia.....	10,517	14,565	19,244	21,478	29,441	33,963
Washington.....	4,339	6,631	15,527	21,217	31,348	31,004
West Virginia.....	6,633	11,778	15,381	15,081	22,768	25,534
Wisconsin.....	8,120	10,873	16,525	24,506	32,267	48,280
Wyoming.....	549	1,128	1,970	2,300	2,959	2,965
Total U. S.....	659,651	908,488	1,157,890	1,446,790	1,892,378	2,203,335

*See Maryland

Distributor-Dealer Doings

Georgia Refrigeration Drive 150% of Quota

ATLANTA—Sales of 897 household refrigerators and 272.6 commercial units of \$100 each were recorded by Georgia Power Co. salesmen in their "Plus-Value" refrigeration drive, which closed Sept. 21. Results in the campaign equaled 146.2% of quota, best record on a major appliance drive this year.

Of the 144 salesmen participating in the campaign, 102 qualified for "plus bonuses" for exceeding their quotas; 38 men turned in 200% of quota or more, and three landed in the 300% of quota bracket.

Three "super-super" salesmen were M. F. Wilson of Decatur, who sold 21 refrigerators or 350% of quota; W. E. Mumford, who sold 16 units to reach 320%; and S. N. Wright of Columbus, who sold 15 refrigerators to hit an even 300%.

W. C. Rhinehart of Augusta topped the commercial salesmen with 248.75% of quota. Homer Hendon led class "B" men with 295% of quota; L. S. Paulk class "C" men with 251.11%; F. B. Anderson class "D" men with 258%; and C. F. Harrell selling local managers with 266.67%.

R. F. Allen, apartment house sales manager in Atlanta, topped store managers and district senior salesmen with 40 refrigerator sales for 333.33% of quota. C. P. McRae led class "B" men with 179.5%; A. P. Gilmore class "C" with 196%; J. A. Simmons class "D" with 204.17%; N. A. R. Lawrence led division senior salesmen with 180.26%; and J. R. Holt topped division commercial men with 212.8%.

Milwaukee Retailers Change Organization

MILWAUKEE—Under a revised plan of management just put into effect, Wisconsin Radio, Refrigeration & Appliance Association is now being operated under the direction of H. L. Ashworth as secretary-manager, subject to guidance by the board of directors.

The plan calls for temporary suspension of the offices of president and vice presidents, leaving only that of treasurer, which continues to be held by A. C. Schleiger. Resignations of the president and vice presidents have been accepted to allow the new plan to go into effect.

Revised plan of operating the association was felt advisable because of the many problems and complications resulting from the labor relations program confronting the industry and members of the association.

Not being engaged in any phase of the appliance business, the new secretary-manager can meet and deal with this situation without being "put on the spot" from a business standpoint, it is felt.

Tried out for several weeks without a general announcement, the new plan has operated satisfactorily, it is reported.

Rochester Association Has Commercial Show

ROCHESTER, N. Y.—The construction material show sponsored by Electrical Association of Rochester was scheduled to open here Oct. 18 and continue through Oct. 20. The event originally was set for Oct. 4-6.

Exhibit will be held in the main auditorium of Rochester chamber of commerce, and will include both construction equipment and industrial and commercial lighting.

New Dealership Opens In Sheboygan, Wis.

SHEBOYGAN, Wis.—United Radio & Specialty Co. of which Edward Nordby is the owner opened here recently as a dealer in Majestic radios with a store at 522 N. Eighth St. Ed. F. Hillebrand has been placed in charge of local sales.

Retail Demonstrations Draw Praise From Business Leaders

NEW YORK CITY—Lifting itself by its bootstraps, so to speak, the retail industry, through the first National Retail Demonstration, seems to have elevated itself to a position of importance in the public eye and to a higher place in its own esteem, according to reports from the National Retail Dry Goods Association.

U. S. Secretary of Commerce Daniel Roper, in a nationally broadcast radio address, expressed appreciation of retail effort and understanding of the economic and social value of retail service; President Roosevelt issued a letter approving the retail demonstration and calling attention to retailing as an important link in distribution; newspapers generally came forward with favorable editorial comment.

"We believe," said N.R.D.G.A. President Saul Cohn, "that these manifestations are deeply significant of the ability of the retail world to establish a sounder and better basis of public understanding of retailing and one which will do much to promote the growth of confidence not only in retailing but in the entire business structure of the nation."

EACH STORE HAD OWN PLAN

The promotion took all manner of forms in various localities, including fashion shows, essay contests, street parades, mass meetings of retail employees, and "open house" celebrations. Partially responsible for this originality, no doubt, was the request of Mr. Namm's planning committee that each store interpret the idea in its own way. Sole universal requirement was that each town and every merchant do something.

Charles R. Hook, president of American Rolling Mill Co. and of the National Association of Manufacturers, described the National Retail Demonstration as the type of national cooperation which will enable the country to "again resume its march toward more jobs and better living for all our people."

Praising the demonstration for placing emphasis upon the "essential link between the producing facilities of the nation and the consumer," Mr. Hook stated: "In the final analysis, it is the consumer who makes jobs. When the consumer goes to the retailer and makes a purchase, he participates in an endless chain of activity that may stretch completely across the country and touch, perhaps, a dozen different types of industry."

PLAN 1939 ATTACK

"Already we are planning for the Retail Demonstration of 1939. We are collecting information from all over the country on what was done this year and the results, and we have already prepared a long list of new ideas for next fall."

Declared Benjamin H. Namm, first vice president of N.R.D.G.A. and chairman of the committee which planned this year's demonstration: "Even more important than the flood of publicity given the retail industry is the way in which hundreds of cities cooperated in the demonstration, and the lift which this cooperation undeniably has given to recovery. Perhaps the demonstration has produced the right formula for making retailing integral and important."

Participating retail merchants almost unanimously pronounced the demonstration a welcome stimulus to business, even in the eastern states, where almost continuous rain and a disastrous hurricane combined to slow up retail business or to halt it completely.

Charlotte Westinghouse Dealer Moves Store

CHARLOTTE, N. C.—Continental Electric Corp., dealer in Westinghouse appliances, has moved from 121 E. Trade St. to 423 S. Tryon St. J. A. White is manager of the company.

Schwartz Joins Staff of Zamoiski Co.

BALTIMORE—Harry Schwartz, for the past five years a member of the sales staff of Simon Distributing Co., Hotpoint distributor, has resigned to join the Joseph M. Zamoiski Co., Norge distributor, as representative in metropolitan Baltimore for all Norge products except air conditioning and commercial refrigeration. Earl Neff, who formerly covered

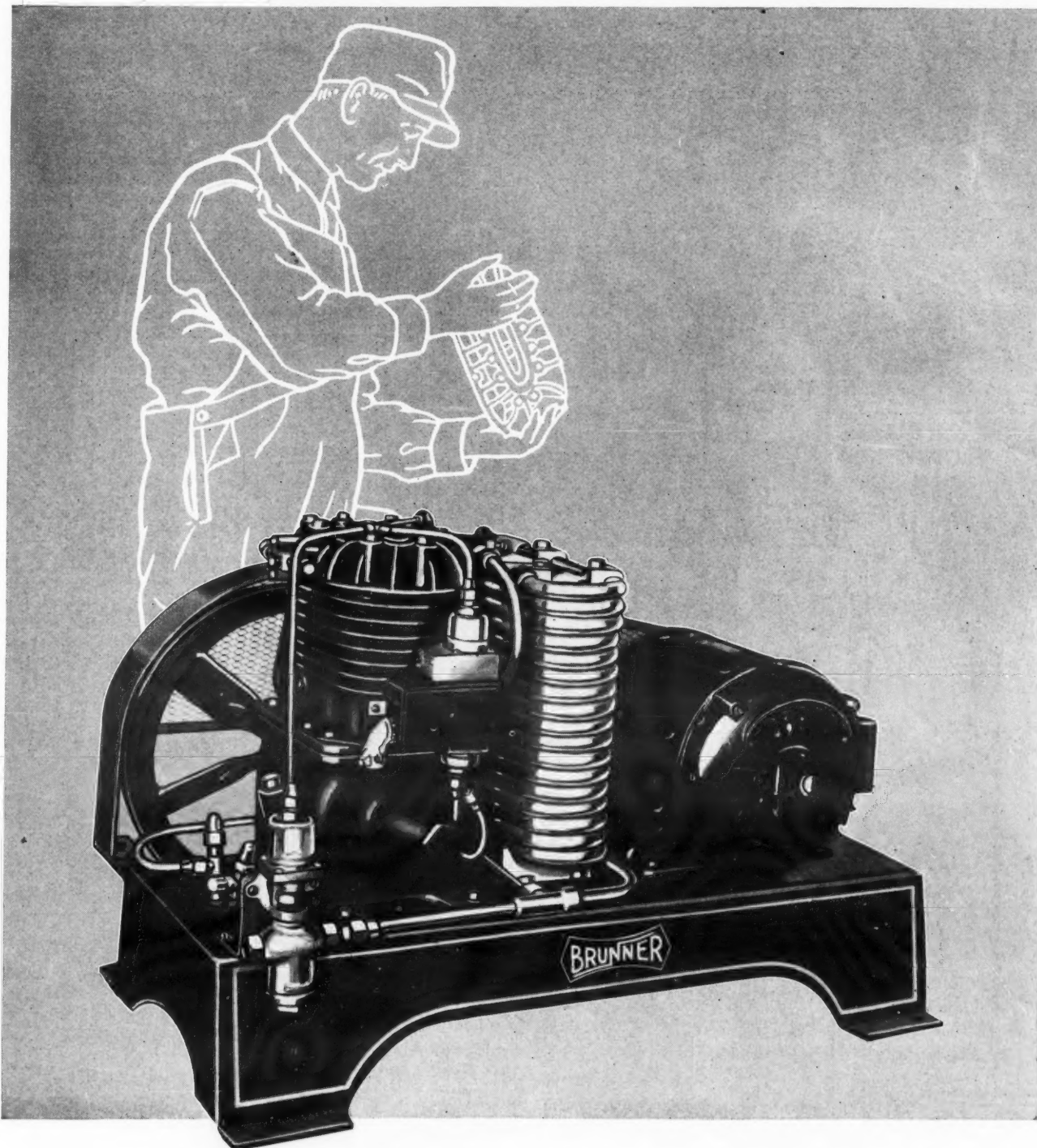
metropolitan Baltimore for Zamoiski, has been transferred to the company's western Maryland territory.

Oscar Levitt, manager of the refrigeration, appliance, and radio division of Peoples Electrical Supply Co., has joined the Simon Distributing Co. staff.

Sam Smart, formerly factory sales representative for Westinghouse in the Washington, D. C. area, has been added to the Simon organization as sales assistant to James H. Simon, head of the company. He will coordinate sales efforts of the staff.

Dealer Puts Kitchen In Store Window

ASHEVILLE, N. C.—What is said to be the first all-electric kitchen ever shown in an Asheville store window is now on display in the show windows of Railroad Salvage Co., Westinghouse dealer here. The kitchen unit features refrigerator, range, water heater, sink, cabinets. Mrs. B. Pearlman, owner of Railroad Salvage Co., also has installed a Westinghouse kitchen in her home.



BRUNNER CASTINGS THROUGHOUT ARE ACTUALLY HEAVIER...FOR ADDED RUGGEDNESS

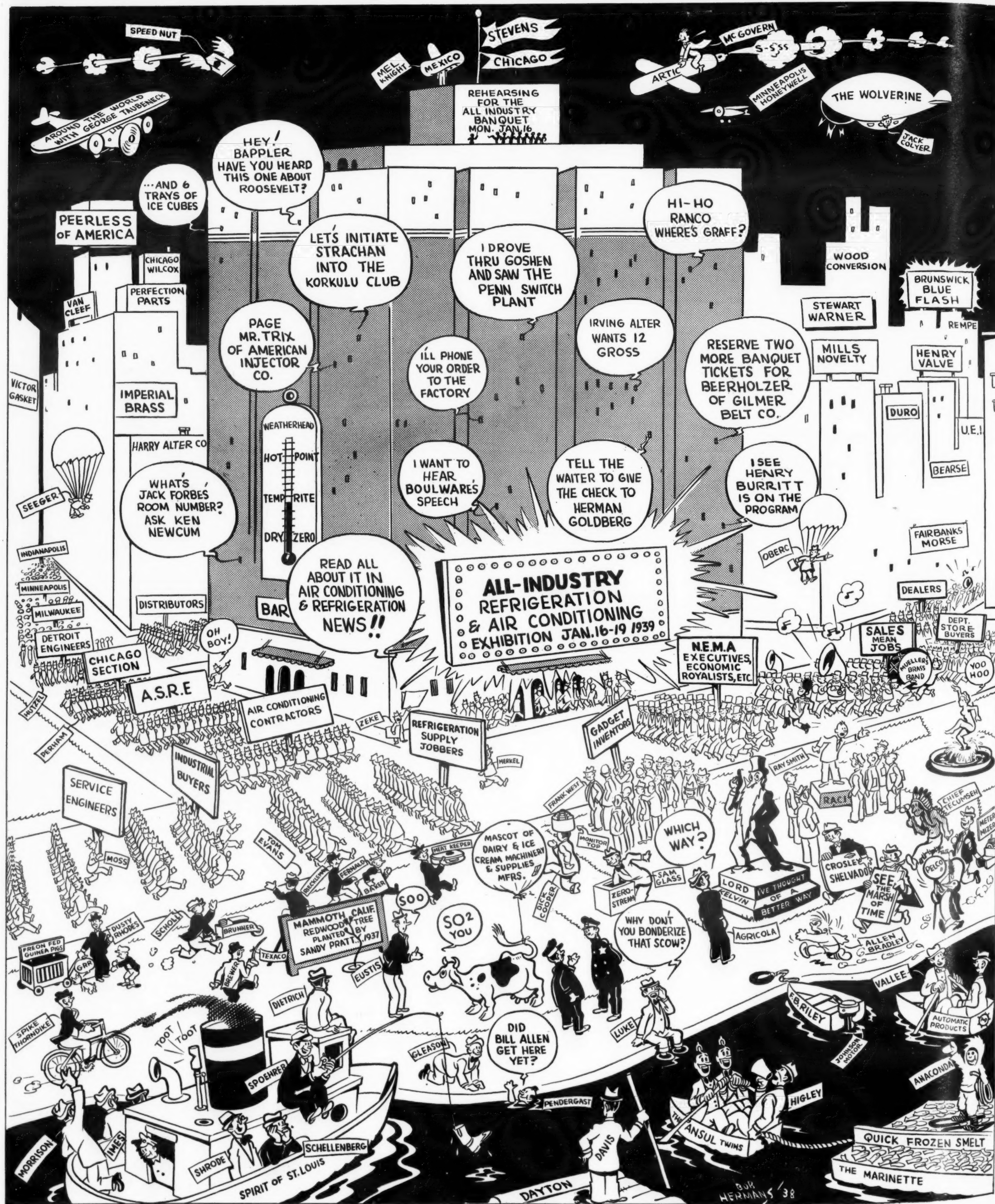
It's just common-sense engineering to add a "factor of safety" wherever performance is a vital consideration. But it is seldom you find commercial designs protected by so large a margin as you find in Brunner equipment. "Overprecautions," you might term Brunner engineering. Yet, experience has proved its value. Brunner castings, for example, are unusually heavy, far exceeding ordinary performance requirements. This is especially true of the super-duty castings of the compressor. Thanks to this rugged difference, Brunner Refrigerating and Air Conditioning units give a good many extra years of trouble-free service... Air and water-cooled models ranging from $\frac{1}{4}$ to 15 horsepower... Better get the whole story at once.

Brunner Manufacturing Company, Utica, N. Y., U. S. A.

IT'S **BRUNNER** FOR *economical* SERVICE

Opening Day at the First All-Industry Exhibition in Chicago

The News Cartoonist Forecasts the Scene on Michigan Boulevard and the Lake Front When All Branches of the Refrigeration and Air Conditioning Industry Converge in Chicago to Open Their 1939 Campaign to Expand Markets for New Applications of Refrigeration and Air Conditioning and Replace More Than A Million Obsolete Household and Commercial Installations Which Have Been in Service 10 to 20 Years.



Air Conditioning

Cooperative Drive on Air Conditioning In El Paso Said To Boost Volume By \$100,000

EL PASO, Tex.—Air-conditioning equipment dealers in this city increased their business well over \$100,000 during the last season through a cooperative marketing program in an added field—the evaporative cooling of single residences.

Encouraged by this year's results, the same group of dealers plan a broader development of the new market during the 1939 season, with a program of more intensive merchandising and advertising along lines proved successful in the past campaign.

Active drive to sell evaporative coolers began in January, when dealers met with El Paso Electric Co. to consider plans for broader air-conditioning sales. It was apparent that owners of most of the city's single residences could not buy complete air-conditioning equipment, and that a development of this market must be based on sales of comparatively inexpensive units.

Because of the low humidity throughout El Paso summers, evaporative cooling is highly efficient. Investigation showed that such coolers had been built for a number of homes and business places, but that their construction, installation, and operation were not well standardized.

FACTORY UNITS ONLY

Dealers decided to handle only factory-built units, and to limit their distribution, so far as possible, to air-conditioning and appliance firms capable of effective merchandising and acceptable installations.

Entire program for residential conditioning was on a cooperative basis. There was ample competition, however, for before the season's end 32 dealers in El Paso and surrounding towns were selling the units.

Realizing that installations must be satisfactory to gain customer endorsements, most dealers had their installations made by a central agency. This firm equipped a truck for building all types of frames and hangers, electrical and water connections, and developed a standardized method of installation that proved highly satisfactory.

SOLD ON TIME BASIS

Many of the units were sold on time payments, with banks and commercial agencies accepting the paper. Usual terms were for the length of the cooling season, but some contracts extended over 12 or 18 months.

Sales and advertising program, worked out with the help of El Paso Electric Co., included direct-mail, newspaper advertising and publicity, and radio broadcasts. Each dealer made an initial contribution to the cooperative program, and purchased newspaper space in proportion to the size of his business.

J. F. Hudson of the utility company prepared a complete visual presentation of evaporative cooling which was duplicated for dealers' salesmen and floor demonstrations.

ALL TYPES OF PROMOTION

Campaign was launched officially on April 12, at a special "air-conditioning" meeting of El Paso Electric League. First cooperative promotion used radio spot announcements for three months. The announcements were made only on hot days, when listeners were naturally concerned with adding to their personal comfort.

Another appeal, used in direct sales work and advertising matter, featured an all-summer "vacation" in a cool home, at less cost than a short trip to mountains or seashore. Other effective announcements described the principles of cooling, compared the necessity of cooling with that of heating, and made direct appeals to business men as well as home owners.

Dealers were supplied with two-color folders illustrating and describing evaporative coolers, but using no brand names. These were used to answer advertising inquiries, and

also were distributed as envelope stuffers by dealers and the utility.

Climax of the campaign came on May 10, when the El Paso Herald-Post published a special eight-page section on air conditioning, carrying advertising by all dealers in the city. Articles in the section described several outstanding installations, and told of the advantages and principles of this type of equipment.

Air-conditioning companies reported that their promotion of evaporative coolers increased, rather than hurt, business in other lines of air conditioning.

'Thermos Bottle' Cooling Plants Recommended For Church Use

BOSTON—The idea of churches being air conditioned by a giant thermos bottle was discussed recently at the meeting of the Power Engineers Association.

Walter A. Grant, district chief engineer for Carrier Corp., described this method as being ideally adapted because of the short periods during which churches are used.

"It appears self-evident," stated Mr. Grant, "that an application such as air conditioning a church for only a few services a week will permit the use of a very small refrigeration plant storing up cooling effect 24 hours per day for the six week days, and releasing all of this stored cold in a veritable avalanche for the relatively few hours of actual use."

"There are a number of similar applications," he continued, "where storage is the obvious solution. Under this heading come cafeterias operat-

ing just during noon hour. This is the method used in the Carrier employees' cafeteria at the Syracuse plant. Also funeral parlors and certain classes of auditoriums can provide summer comfort with this system.

"Water is gradually cooled and stored in a large insulated tank that is virtually a thermos bottle. This chilled water is then released to the air-conditioning system where the air is cooled to the desired temperature for comfort."

Desert Cooler Firm Now Making All-Year Unit

LOS ANGELES—Addition of a complete line of all-year conditioners has been announced by Utility Fan Corp., manufacturer of blowers and "Desert Coolers."

The "All Year Conditioner" is a self-contained unit designed for the conversion of gravity hot air furnaces into forced draft heating plants. It is equipped with "Dust-Stop" filters, Randall bearings, and a General Electric motor.

Barker Heads Airgard Activities In East

CHICAGO—Ray L. Barker has been appointed eastern manager for the Airgard Mfg. Co. of this city, manufacturer of air-conditioning equipment.

Mr. Barker had recently resigned as district manager for Carrier Corp. in the New Orleans territory. Previously he had been connected with Peerless, and with other firms in the industry.

Harten & Knodel Makes Plans on Philco Cooler

DAYTON, Ohio—Plans are being made by R. H. Lane, manager of the Philco division of Harten & Knodel Distributing Co., local distributor of Philco and Norge products, for the introduction of the new ¾-ton Philco package room air conditioner in this territory next spring.

The company formerly held a Carrier franchise for this section.

PEERLESS OF AMERICA
ESTABLISHED 1912 AS THE PEERLESS ICE MACHINE CO.
MANUFACTURERS OF
Refrigeration and Air Conditioning Equipment

GENERAL OFFICES
515 W. 35th STREET, CHICAGO
FACTORIES
NEW YORK-CHICAGO-LOS ANGELES

Refrigeration & Air Conditioning Institute
2130-2154 Lawrence Avenue
Chicago, Illinois

You should know
MORE ABOUT THIS NEW TYPE OF CRAFTSMAN ★

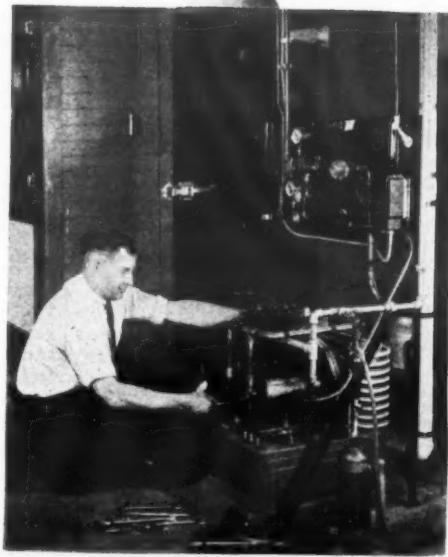
... need for a refrigeration engineer. We presented us an opportunity to test the reports we had had of your institution. The results you know. The sure.

Two or three graduates, suggested by you, were interviewed from which we made our selection. He has given excellent service from the beginning, and we assure you, we're delighted to know of so reliable a source for trained men.

Would like also to take this opportunity to compliment you on your method of rating. It is thorough and most accurate, and we feel that it would be difficult making a mistake selecting a man so excellently rated and recommended by you.

Cordially yours,
R. H. Lane
PEERLESS OF AMERICA, Inc.

MORE THAN
100 MANUFACTURERS
OFFICIALLY ENDORSE
AND RECOMMEND
THIS TRAINING



TRAINING IS SUPERVISED BY
A MANUFACTURER-APPOINTED
BOARD OF GOVERNORS

Trained the Way the Industry Wants Them Trained...

Could you ask for more... a man especially trained to do Air Conditioning and Refrigeration work, and carefully analyzed to suit your particular requirements?

Yes... that is the service that R.A.C.I. is providing distributors and dealers throughout the country—and why we believe you should know more about this NEW TYPE OF CRAFTSMAN.

All our graduates have had 1000 hours of home study, plus four weeks (since July 1, 1938) of intensive shop work in our new and modern laboratories in Chicago—where, working on equipment valued at more than \$100,000, they have had to dismantle, rebuild, install and service ALL TYPES of conventional Air Conditioning and Refrigeration equipment.



FREE PERSONNEL SERVICE—The individual qualifications of each R.A.C.I. graduate are recorded in a convenient form for your inspection. Our Placement Service is free to employer and graduate alike. Let us send you the records of a few of our graduates in your neighborhood.

Refrigeration & Air Conditioning Institute

2130-2158 LAWRENCE AVENUE • CHICAGO, ILLINOIS

Refrigeration Service Engineers Meet for Fifth Conclave Nov. 2-4 in Buffalo

Practical Problems To Be Discussed at Technical Sessions

BUFFALO—Willis H. Carrier, chairman of Carrier Corp., will headline the list of speakers to be heard by members of Refrigeration Service Engineers' Society at the organization's fifth annual convention, to be held here Nov. 2 to 4, with the Niagara Frontier chapter of the society as host.

Mr. Carrier will address the convention at its opening session on the morning of Nov. 2.

Practical side of servicing and installation work has been given major consideration in the convention's educational program, with topics of technical nature eliminated in favor of the more meaty practical problems. This is in contrast with the procedure followed by the society in its previous annual meetings.

Discussions of dryers and drying agents, controls and their servicing, the servicing of ice cream cabinets, servicing hermetic units, and service opportunities in the beer dispensing field are among the topics scheduled for discussion. Several educational movies, among them one on frozen foods, also will be shown. A tube-

This Committee Makes Plans for Meeting of Service Society



These members of the convention committee of the Niagara Frontier Chapter (Buffalo) of the Refrigeration Service Engineers Society have done a big job in completing plans for the fifth annual convention of the society to be held Nov. 2-4 in Buffalo. Plans for the meeting are given in the story on this page. (Front row, left to right) Joe Askin, J. Kearney, George O'Hara, G. E. Wilson, D. B. Schuster, Fred Cameron. (Back row) E. Wiese, J. Bush, Charles Rittling, Ray Henke, H. McMillan, W. Fryer, R. Davis, and B. Bush.

bending contest is another feature of the convention program.

Entertainment features include a trip to Niagara Falls, an amateur night, the annual R.S.E.S. banquet,

and a farewell party the night the meeting ends.

Official business of the society will occupy most of the opening session Wednesday morning, Nov. 2.

After the call to order by D. B. Schuster, president of the Niagara Frontier chapter, the invocation, and a welcome by a representative of the city of Buffalo, national officers will be introduced. Mr. Carrier will then address the convention. Following this will be the address of National President W. Hall Moss, and reports of Secretary H. T. McDermott and Treasurer S. A. Leitner.

Committee reports to be heard include: educational, George H. Clark; unit labor survey, P. B. Reed; trade relations, G. L. Uetz; membership, E. A. Plesskott; dehydration of refrigeration equipment and systems, W. W. Farr; and reports of year book and publicity committee heads.

Convention committees then will be named, and other business announcements made. Afternoon will be taken up by a tube-bending contest, sponsored by Imperial Brass Mfg. Co., and a sight-seeing trip to Niagara Falls. An "amateur night" will feature the first evening's entertainment.

A "question box" conducted by George H. Clark will open the business session on Thursday, Nov. 3. "A Generation in Refrigeration Service" will be discussed by A. Hulbert, and "Refrigeration Service Opportunities in the Beer Dispensing Business" will be outlined by C. D. McLaughlin.

Following a sound film, "They Know How," V. E. Hall will speak on "Dryers and Drying Agents," and V. E. Graff of Ranco, Inc. will discuss "Controls and Their Servicing." A report of the nominating committee and election of officers for the coming year will wind up the day's business conclave.

Another sound film, this one titled "Imprisoned Freshness," and dealing with frozen foods, is scheduled for the afternoon. The annual R.S.E.S. banquet and entertainment will be held that night.

Program for Friday, Nov. 4, will lead off with a few "Refrigeration Service Tips," by A. Walter, Fedders Mfg. Co., after which "Servicing Hermetics" will be discussed by S. R. Thompson, Refrigeration Maintenance Corp. "Selling America," a sound film, will then be exhibited, to be followed by discussions on "Servicing Ice Cream Cabinets," by E. J. Newcomer, Mills Novelty Co. field engineer, and "Pressure Drop of Liquids Through Tubing," by George H. Clark.

A manufacturer's exposition of products for use by the service man will be one of the features of the convention. The exposition will be open throughout each day of the convention, so that those attending can inspect the exhibits at their leisure.

ALCO New Multi-Outlet THERMO VALVES

- Increase distribution efficiencies up to 35%
- Increase coil capacities over 20%
- Save the cost of distributor Headers!

ALCO now offers the industry one of the greatest advances ever made in the field of refrigerant control—the Alco Multi-Outlet Thermo Valve. This valve is the result of several years of research and of exacting tests by Alco engineers on more than 250 types of evaporators. Research disclosed that inefficient distribution was the weakest part of most coils—a condition that heretofore has necessitated a multiplicity of small expansion valves or the use of distribution headers. The Multi-Outlet Thermo Valve eliminates these expensive and often unsatisfactory methods—provision is made inside the valve for distribution of the refrigerant. Better distribution is obtained by providing for distribution to the various circuits before separation of gas and liquid takes place. Elimination of uneven distribution materially increases the effective coil surface, and actual tests show these valves can increase distribution efficiencies up to 35 per cent and increase coil capacities more than 20 per cent!

It will pay you well to investigate the advantages of Alco Multi-Outlet Thermo Valves. Many manufacturers have already ordered these revolutionary new valves, others are carefully considering them for next year's use. Alco's engineers will gladly work with you in solving your control problems. Write today.

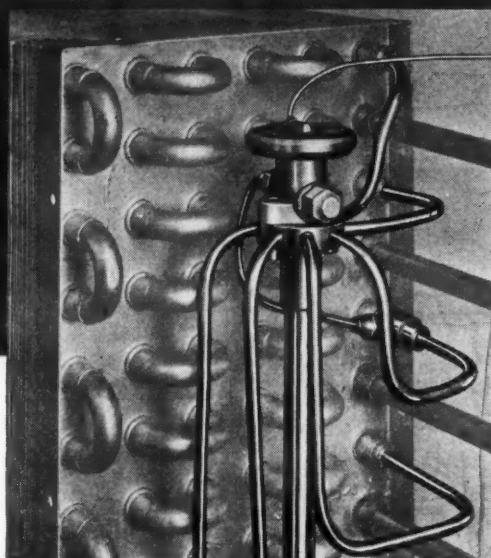
Alco Multi-Outlet Thermo Valves are manufactured under U. S. Patent No. 2,079,579, other patents pending.

ALCO VALVE CO., Inc.
2620 BIG BEND BLVD.
ST. LOUIS, MO.



ENGINEERED REFRIGERANT CONTROLS

FOR HIGHEST EVAPORATOR EFFICIENCY



You Save Three Ways:

- 1 The Multi-Outlet Valve saves labor and material costs by eliminating the necessity of expensive distribution headers.
- 2 It gives a decided increase in coil capacity as a result of improved distribution of the refrigerant—utilizing more surface for the absorption of heat load.
- 3 It eliminates the possibility of misapplication of controls in the field—as present methods of distribution and resulting efficiency depend largely on the application of expansion valves to your coils.



Included among the recent installations using Alco Multi-Outlet Valves are a fleet of 50 Greyhound buses air conditioned by Tropic-Aire, Inc.

The Warner Bros. Roger Sherman Theatre, New Haven, Connecticut, was recently air conditioned by the Typhoon Air Conditioning Co., and the Bush Coils used were equipped with 12 Multi-Outlet Valves.

ANNIVERSARY



What a pleasant sensation it must be for any enterprise to be able to celebrate its 500th Anniversary, particularly an industrial newspaper where every initial issue represented a triumph of courage and faith in the industry it portrayed. We gladly join in the chorus of felicitations to the publisher of this journal on the epochal 500th issue of Refrigeration News.

Many years have come and gone since Commonwealth Brass Corporation first served the infant business of automatic refrigeration, 26 to be exact, and during that period the corporation has steadily grown in facilities, volume of production, and experience in this industry.

Today the management looks back a bit proudly to the record of years of service to leaders of refrigeration history, and faces the future with unbounded faith in the formula on which Commonwealth progress is founded. Briefly, the concept comprises only two words.

ORIGINALITY—EXCELLENCE

two attributes necessary for the production of fittings

"Built Right To Stay Tight"

With the increasing acceptance of refrigeration and air conditioning as a major factor in the every-day life of the modern world we are confident of its future and ready, willing and able to play our part in its development as we have for the first 26 years of its history.

For Originality and Excellence in fittings for the industry consider Commonwealth as the preferred source of supply.

COMMONWEALTH BRASS CORPORATION
Commonwealth at Grand Trunk R.R.
DETROIT, MICH.

Service

Local Chapter Representatives To Compete In Tube Bending Contest at Service Meeting

BUFFALO—A tube-bending contest, in which representative members of various local chapters of Refrigeration Service Engineers Society will compete, will be sponsored by Imperial Brass Mfg. Co. at the society's fifth annual convention to be held here Nov. 2 to 4.

Announcement of the contest is being made this month at meetings of the local groups, one man from each chapter being invited to participate. The contest is scheduled for the afternoon of the convention's first day. Prizes will be awarded to the winners of first, second, and third places.

Contestants will be asked to bend and erect soft copper tubing and flare fittings into the design specified in a blueprint to be supplied at the contest. Sample blueprints, showing an example of the general type of problem to be used, are already in the hands of each chapter, as are the rules of the contest.

Entrants are asked to bring their own tools, but tubing and fittings will be supplied by the sponsoring manufacturer.

The company has expressed the hope that each chapter of the society will enter a representative, whether skilled or not, and that this contest will serve to introduce the idea into the individual chapters.

Rules of the contest, which may be subject to some slight changes, follow:

Every contestant must register with the judges before starting.

Only one contestant from each R.S.E.S. chapter will be permitted to enter.

Contestants will bend and erect copper tubing and flare fittings into the design specified in the blueprint which will be supplied at the contest.

Each contestant will furnish his own bending, flaring, and cutting tools, wrenches, and rule for measuring. (Contestants may bring whatever tools they feel they need. However, no special bending jigs will be allowed, and tools must be of a standard nature.)

Soft copper tubing and fittings will be provided by the sponsors of the contest. No pipe joint compound need be used on any joint.

The winners shall be determined on the following basis:

The first three who complete the problem and lay it on the finish table shall have their elapsed time recorded. Elapsed time shall not alone determine the winner, however; the following conditions will be considered:

A tolerance of plus or minus 1 inch will be allowed on all dimensions shown on the problem sheet.

Should any dimension exceed this tolerance the entry is automatically disqualified.

For any of the following conditions found on the completed problem, the contestant shall have added to his actual elapsed time the amount set forth:

Each poor flare on tube joint . . 15 seconds.

Loose flare nut 15 seconds.

Marred brass nut or brass fitting (such as the marks made by pipe wrench). Each fitting marred . . 15 seconds.

Kinked or flattened tube . . . 60 seconds.

General form of problem not followed although dimensioned points are within tolerance . . . 60 seconds.

When the above penalty times have been added to the contestant's actual elapsed time, the contestant having the least total time, including assessed penalties, shall be declared the winner.

Massachusetts Sponsors Courses In Refrigeration And Air Conditioning

BOSTON—Several courses in refrigeration and air conditioning have been announced for this term by the university extension division of the Massachusetts Dept. of Education.

Two lecture courses covering household and commercial refrigeration, with a total of 24 lectures, are being conducted by Leo F. Carton, installation and service supervisor, General Motors Sales Corp., and instructor in refrigeration at Wentworth Institute. Part 1 is devoted to household refrigeration, part 2 entirely to the usual types of commercial refrigeration, and part 3 to the selection of the proper types of evaporators, compressors, etc.

P. A. L. Foulds, consulting engineer, is scheduled to give a course of eight lectures on practical air conditioning for residences, restaurants, stores, and offices. This is intended for salesmen, draftsmen, designers, builders, textile engineers, and beginners.

Another course in air conditioning for factories, theaters, other large buildings, and railway cars, is being given by Raymond U. Fittz, professor of mechanical engineering at Tufts college. This course is also offered by correspondence, at a nominal charge.

Charles A. Cummings, sales engineer for Minneapolis-Honeywell, also has charge of a course on all types of automatic controls for air conditioning and heating.

Widow Will Direct Tulsa Service Organization

TULSA, Okla.—Following a rather unusual line of endeavor for one of her sex is Mrs. Al Henderson, who has taken over management of the Al Henderson, Inc., refrigeration service business formerly operated by her husband, who died recently.

Handling the operation of a wide range mechanical service organization is not an entirely new job for Mrs. Henderson, however. For the past nine years, she has been general office manager of the firm, and had an active part in all the company's affairs.

The company will continue to do commercial refrigeration service and air-conditioning installation work, and all employees who were with the company previously have been retained under the new management.

Mark Jennison, who has been with the company for eight years as expert technician on commercial refrigeration equipment and air-conditioning units, has been appointed shop foreman and superintendent. Assisting him is L. C. McKim, specialist on refrigerants, who has a background of 12 years' experience and has been with the Henderson organization for the past year and a half.

Lee Henderson, son of Mrs. Henderson, also is a member of the regular service staff, as is Paul Cadwell, who has been in the refrigeration business in Tulsa for the past 10 years.

Guests at Philadelphia Meeting



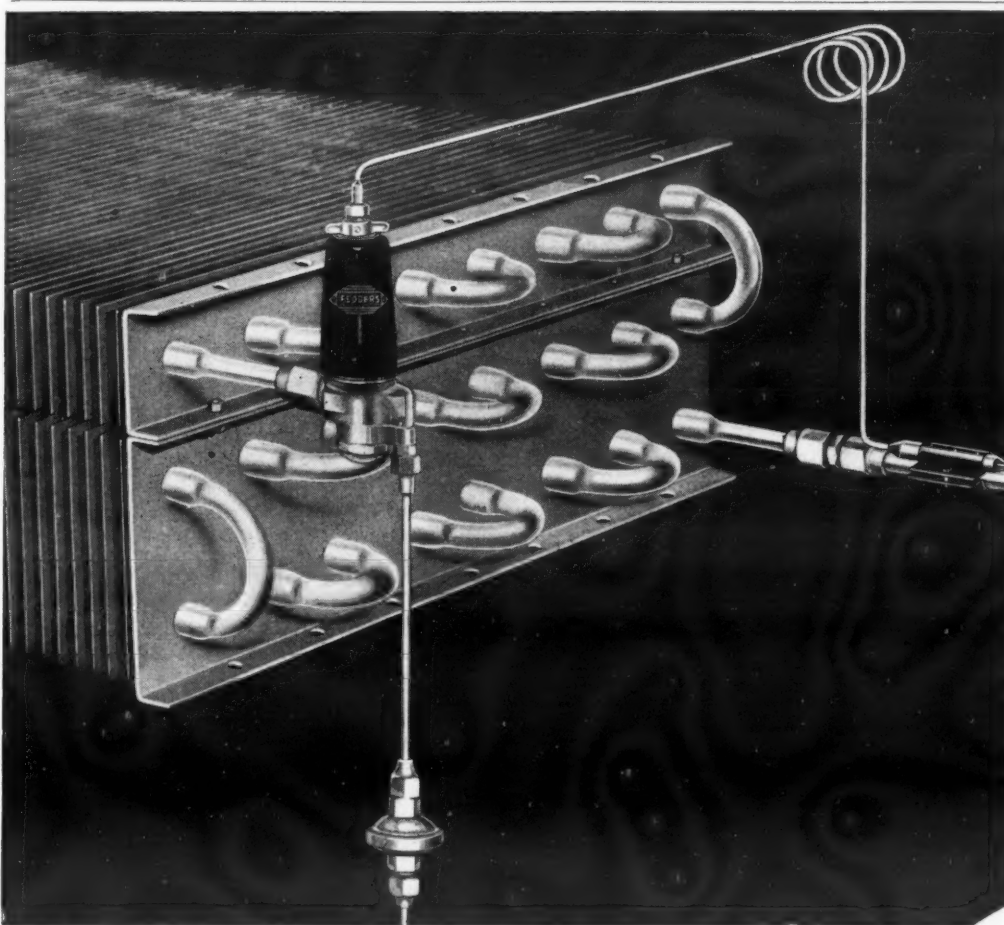
Representatives of the refrigeration industry in Philadelphia and the neighboring area were guests of Victor Sales Corp., supplies jobber, at a recent meeting which included a demonstration of the Alco glass evaporator by R. S. Dawson of Alco Valve Co. and open discussion led by Alec Holcombe, head of the jobbing firm. Left to right in this picture are: F. E. Corey, Lipman Sales Co. of Philadelphia; Harry Klinger, sales manager of Trenton Auto Radiator; Elmer Gordon, Gordon Refrigeration Co., Camden, N. J.; L. S. Kephart, service manager of Trilling & Montague, Norge distributor; and Mr. Holcombe.

The company's shop is modernly equipped to handle work on all models of commercial equipment, and handles service work in Tulsa proper as well as work for merchants over a 125-mile area in the Tulsa territory. Work includes installation and servicing of air conditioning and room cooler units. Twenty-four hour service is maintained.

The shop is equipped to handle household refrigeration service work also, but specializes on commercial applications. Large stock of replacement parts is carried.

Melchior, Armstrong Opens Branch In Albany, N. Y.

ALBANY, N. Y.—A local branch of Melchior, Armstrong, Dessau Co., refrigeration, heating, and air-conditioning supplies jobber with headquarters in New York City, has been opened at 246 Washington Ave. here. This establishment will carry stocks of refrigeration, heating, and air-conditioning parts and supplies, just as do the company's 11 other branches.



FEEDERS

You Get Complete Service with This Complete Line

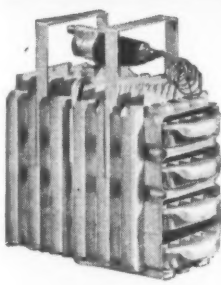
Cataloged and sold on a package basis . . . for use with all refrigerants except ammonia . . . balanced design and performance . . . elimination of duplication in ordering and inventory . . . prompt delivery from representative suppliers everywhere,—those are a few of the economies of standardizing on Fedders.

Fedders complete range of capacities, together with standardized dimensions, save installation time and assure satisfactory performance of new systems and service jobs.

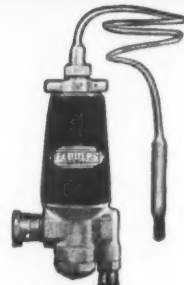
Backed by every test of time and service in every climate throughout the world, it pays to standardize on Fedders Low Side Equipment.

FEEDERS MANUFACTURING CO.
BUFFALO, N. Y.

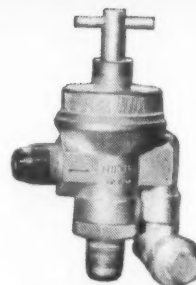
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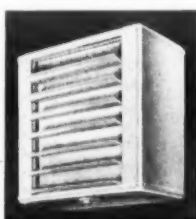
Evaporators



No. 33 Thermostatic Expansion Valves



Constant Pressure Valves



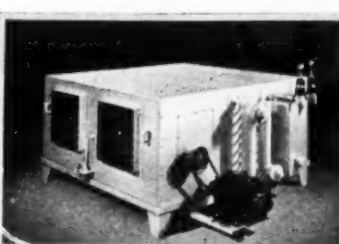
Series 73 Single and Twin Unit Coolers



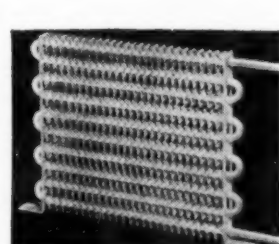
High Capacity Thermostatic and Constant Pressure Valves



Complete Line of Condensers



All Season Air Conditioning Units and Surface



Complete Line of Condensers

Mr. Cockrell, We salute you:

A 500 Gun Salute for having reached a notable milestone in publishing a business paper that is newsy, vital, helpful and interesting—a paper pointed to as a model trade publication.

Another 500 Gun Salute for "hewing to the line, letting the chips fall where they may"—with fairness and without malice.

And another 500 Gun Salute for your successful part in helping to build a great and profitable industry.

THE HARRY ALTER CO.
1728 S. Michigan Ave. Chicago, Ill.
New York Branches In Cleveland St. Louis

AIR CONDITIONING & REFRIGERATION NEWS

Trade Mark registered U. S. Patent Office;
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OCTOBER 19, 1938

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Parts Manufacturers Helped Develop The Industry

WHEN the average housewife goes to her electric refrigerator nowadays, she goes to a gleaming white, highly automatic, fully satisfactory unit which, to her, is a thing of magic.

Today, few users have any comprehension of the sturdy, but delicately balanced, mechanism which gives them automatic refrigeration service. It works so well, looks so neat, and is generally so dependable, that they come to think of it as one piece.

Many Manufacturers Required For Single Refrigerator

Still fewer consumers have any notion of the number of manufacturers who have contributed essential parts to their refrigerator, or to the vast number of inventors and engineers whose efforts have been combined to produce the complete units now on the market.

The salesman has probably given the impression that the refrigerator they bought was sprung full-blown from the laboratories of the manufacturer whose nameplate it bears. Most customers might be a bit frightened, or uninterested, if told how many different manufacturers really shared the responsibility for the making of an electric refrigerator.

Automatic Refrigeration Quest Stimulated Research, Invention

In the industry, however, full credit should be accorded the makers of parts, materials, and supplies whose research and engineering skill has made possible the high development of electric refrigeration as we know it today.

While the fundamentals of the science of refrigeration were understood many years ago, it was not until the pioneers in the household field determined to produce automatic refrigeration that the refrigeration industry received the impetus for its real growth and development.

This drive to produce automatic,

quiet, dependable, economical refrigeration units which could be placed in the hands of the general public (without the necessity of hiring an engineer to operate them) stimulated the inventive skill of the gadget makers. It led to a painstaking search for new materials, and to a long series of adaptations of devices which had been used for other purposes.

Designing Engineers Came From Other Industries

Frigidaire, Kelvinator, Copeland, Servel, and others adopted machines designed by automobile engineers, machines which embraced adaptations of many principles used in the making of internal combustion engines. Electric motor engineers worked on the design of the Westinghouse unit; General Electric's Monitor Top was first produced in its turbine department.

Few of these early designers of automatic refrigeration machines were originally refrigeration engineers. They were experts in the production of other types of mechanisms, and simply brought their trained minds and practical experience to the attack of new series of problems.

Some of the Problems Which Were Solved By Parts Makers

And so it was with the parts manufacturers. Makers of copper tubing, for example, found it necessary to deliver their product dehydrated and free from scale. Makers of valves and seals increased their standards of precision and efficiency. Chemists went to work and developed new finishes which wouldn't crack or chip.

Foundries had been making castings for years, but never had they been confronted with so pressing a need for making a casting which would be impervious to the leakage of a highly volatile gas. For a long time the waste in rejected castings—plus the waste of gas from leaks—was terrific.

Volatile Refrigerants Held By Seepage-Proof Castings

In the ordinary ice and cold storage plant, engineers had never felt it necessary to hold the ammonia. (It is even claimed that the bulk of present ammonia sales for refrigeration goes to the replacement of losses from leakage.) But the small quantities of such gases as methyl chloride, Freon, and sulphur dioxide which are used in household refrigerators made it necessary to have seepage-proof castings.

Until the advent of the electric refrigerator, theories about insulation went little further than the idea that dead air space retards heat flow. Refrigeration engineers, however, found themselves occupied with problems of moisture absorption, water proofing, settling, and methods of handling, cutting, shipping, and packing insulation. As a result, the whole insulation industry moved forward.

Refrigerator Motors Have Multiple Requirements

In the field of electric motors, the development instigated by refrigeration is well-defined. Fractional horsepower motors had already been designed and produced for a variety of applications. In most cases they were designed with one especial feature in mind,

They'll Do It Every Time . . . By Jimmy Hatlo



SYMPATHIZING WITH A POOR SALESMAN WHO HAS FINALLY CLOSED A BIG DEAL - ONLY TO HAVE THE CREDIT MANAGER PUT THE DAMPER ON IT - THEY'LL DO IT EVERY TIME

say, high starting torque, or high operating efficiency, or quietness of operation. Until the advent of electric refrigeration it was generally assumed that emphasis upon any one feature would mean the sacrifice—or at least the subordination—of other features.

But refrigerator manufacturers demanded a motor with all these desirable features. Motor designers went back to their laboratories and test rooms, and eventually came out with totally new products which filled the bill.

Credit for Today's Equipment Belongs To Many Sources

Electric refrigeration as we know it today, then, has been advanced by hundreds of engineers and inventors working in scores of laboratories for dozens of manufacturers. As old problems were solved, new ones were created; and the lights in the laboratories have seldom been extinguished.

Yet it should be pointed out that in recompense for the enormous contribution they have made to the progress of the refrigeration art, the manufacturers of parts, materials, and supplies have found themselves in possession of many new markets for items which might not have been developed had the demands of the refrigeration industry not been so insistent.

Today these manufacturers take great pride in the part they have played in building a young giant of an industry. They are actively engaged now in the upbuilding of air conditioning—a science which offers exciting possibilities. And they know that as their service to other manufacturers helps the latter to perfect their products, the living standard of the general public rises apace.

A Note of Thanks

To advertisers and others who have cooperated with the NEWS in presenting a picture of the industry's products and services in this 500th issue, we extend our sincere thanks.

The staff is especially appreciative of the complimentary references to the NEWS which appear in several advertisements.

LETTERS

Cartoon Comment

Riley Engineering Corp.
100 Atwater St. East
Detroit, Mich.

Advertising Manager:

We were very much interested and amused, also, at the page enclosed with your letter of Sept. 16, covering the special edition of AIR CONDITIONING & REFRIGERATION NEWS for Oct. 19.

Whoever got up the art work surely did a clever job of it and, as one of those who know the various organizations, we found it very amusing and I believe that others will find it equally so.

F. B. RILEY

Editor's Note: The cartoon referred to appears on Page 24 of this issue of the NEWS.

E. I. du Pont de Nemours & Co., Inc.
Wilmington, Del.

Advertising Manager:

We received your most amusing announcement of the Refrigeration and Air Conditioning Exhibition in Chicago. Certainly there is no objection to showing Mr. McGovern riding on a cylinder; in fact, we would like your permission to reproduce this part of it in our little house organ Arctic Service News.

J. J. LANDY,
Advertising Manager

Red Book Catalog Service Appreciated

Radio Service & Supply Co.
411 E. Pikes Peak Ave.
Refrigerator, Radio, and Auto
Electrical Parts Distributor
Colorado Springs, Colo.

Sirs:

Thank you very much for your special edition of the Red Book and after receiving one I can see why you have thousands of requests for such a book.

It is too bad you are not able to go ahead with the original plan of putting in all catalogs, but the coupon plan will undoubtedly be a big help to a good many service men.

I again express my appreciation for this book and I think it is a fine service.

E. O. REINHARDT

Home Refrigeration Service Co.
Indianapolis—Anderson, Ind.

Publisher:

We appreciate the neatness and compactness of the new "Master Catalog" the "Red Book." It is of great value to our company.

ROBERT BUTTERFIELD

9107 Cumberland Ave.
Cleveland, Ohio

Editor:

This is truly one of the first steps taken toward organizing an efficient service whose merit would grow rapidly within the next few years. In this manner all parts of the various manufacturers may be compared and the part that fits best can be selected this way. And here's more power to you for better service.

ARTHUR J. FARKAS

Interested In Lockers

P. O. Box 716
Quincy, Calif.

Sirs:

Enclosed you will find a check covering the renewal of my subscription to AIR CONDITIONING & REFRIGERATION NEWS for one year.

Other refrigeration publications that I have seen are not to be compared with the NEWS. I agree with those readers who have stated that some of your articles were worth the cost of their entire subscription, as I found some of the service information of great value to me early this summer.

I am quite interested in the refrigerated locker plants and would appreciate any information that you could give me along the lines of service, maintenance, design, etc.

H. L. HOWARD

Philippine Service

72 Mabini, Cebu, Cebu
Philippine Islands

Sirs:

I have read your Master Service Manual on Refrigeration No. 1 in which I am very much pleased of its being practical, simple, and handy. As per advertisement you have three (3) of them, the price for each is not stated. So if you can trust me I should like to buy them all and I will pay you the whole cost upon delivery.

LEONARDO V. ALIWO

From South Africa

W. G. Yapp
Electrical, Radio & Refrigeration
Engineer and Contractor
10b Market Ave.
Vereeniging, Transvaal,
Union of South Africa

Sirs:

I read with interest your advice that Manual No. 4 of Master Service Manuals has just been released for publication, and I take this opportunity of writing to you and requesting you to forward to me, just one copy of Manual No. 4, so as to keep myself right up to date, and I enclose herewith my draft to the value of \$1.50 in U. S. funds, to cover the cost of the new manual and postage, and if there is any money left over, just hang on to it, in case I need further publications in the future.

Please forward Manual No. 4, per International Book Post, and make sure that you send copy of invoice ahead, so that I may be able to present same at my local postoffice, when claiming the Manual No. 4.

Thanking you in anticipation of your prompt attention, and assuring you of my appreciation of your Master Service Manuals.

W. G. YAPP

'All Manuals Helpful'

271 S. 15th St.
Philadelphia, Pa.

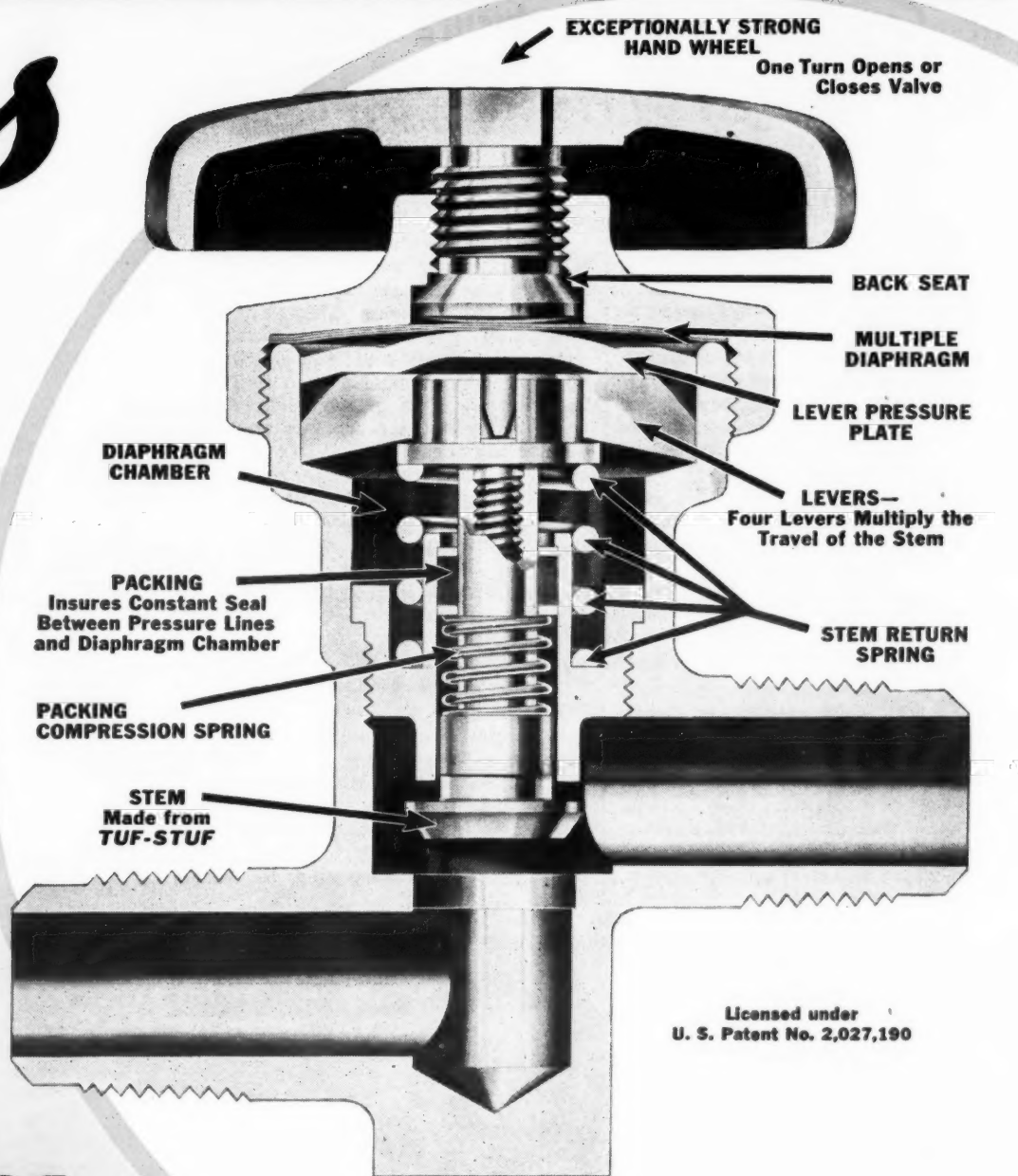
Sirs:

Please send me Manual B-1 dealing with selecting and installing air-conditioning systems. I have all your other manuals and find them very interesting and helpful in my work.

FRANK PAUL

MUELLER BRASS CO. PORT HURON MICHIGAN.

Announces a new "TRIPL-SEAL" DIAPHRAGM VALVE for Refrigeration Lines



● The new Mueller Brass Co. TRIPL-SEAL Line Valve is constructed upon a new and revolutionary principle. As may be seen from the above illustration, it is operated by means of four levers. When the handle is turned, the diaphragms move downward slightly, contacting the lever plate which in turn causes the levers to multiply the travel of the stem in an approximate ratio of three to one in opening or closing the valve.

INCREASED DIAPHRAGM LIFE

BECAUSE OF THE SMALL AMOUNT OF MOVEMENT, THE MULTIPLE DIAPHRAGM, WHICH HAS APPROXIMATELY TWENTY PER CENT INCREASED SURFACE AREA OVER OTHER TYPES OF DIAPHRAGMS, IS NEVER DEFLECTED PAST ITS NORMAL CENTER, THUS IMMENSURABLY PROLONGING ITS LIFE.

In conventional diaphragm operation, the diaphragm operates through and beyond its center point. Continued operation fatigues the metal at its edges where it is secured in the valve.

A SINGLE TURN ONLY IS NECESSARY TO OPEN OR CLOSE THE NEW TRIPL-SEAL VALVE.

TRIPLE SEAL

Positive sealing at three essential points in the valve is adequately provided for—a back seat with valve in open position,—the multiple diaphragms,—and a packing

around the stem. (This packing insures constant seal between pressure lines and diaphragm chamber.)

The stem of the new TRIPL-SEAL Valve is provided with a sixty degree bevel, thus procuring the most desirable wedging action for positive and easy closing. It is manufactured from Tuf-Stuf, a strong, corrosion-resistant alloy.

The operating stem does not rotate, and is constantly guided into the same position against the seat by a cylindrical guide, so processed as to eliminate any possibility of distortion.

The body and cap of the valve are forged brass to eliminate seepage and to withstand frost action; mounting lugs are forged integrally with the body to provide the ultimate in mounting strength.

The handwheel is exceptionally strong, and is so designed that it provides an exceptionally convenient grip for manual operation.

Valves are furnished in two-way, three-way, and angle type—flared or solder type ends—and in complete range of all necessary sizes.

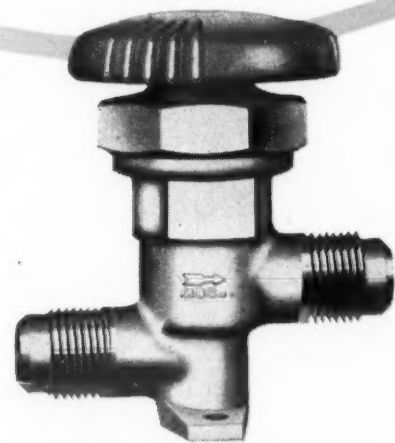
Illustrated literature with complete details furnished on request.

IMPORTANT—Inspect the new valve at our booth, R.S.E.S. Convention, Buffalo, November 2-4.



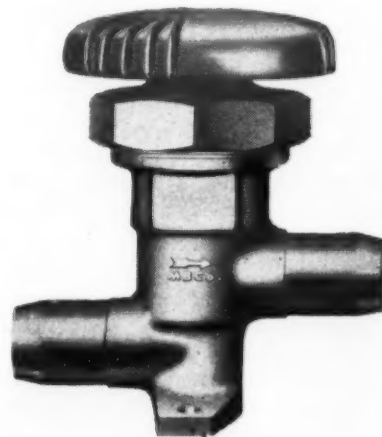
MUELLER BRASS CO.

PORT HURON, MICHIGAN



FLARED TYPE ENDS

Valves are furnished two-way, three-way, and angle type in all required sizes.



SOLDER TYPE ENDS

Valves are furnished two-way, three-way, and angle type in all required sizes.

Air Conditioning

Air Conditioning Helps Insure Safety of Plane Passengers By Protecting Instruments

PITTSBURGH—Safety in modern air travel depends on skilled pilots, who in turn depend upon the accuracy of sensitive instruments. Decisions which affect the safety of passengers and plane are made from instruments which have a sensitivity of perception not possessed by man. Instruments that guide the Pennsylvania Central Airlines' fleet of twin-motored planes over eight states are tested in the air-conditioned headquarters laboratory at Allegheny airport here.

"By controlling temperature and humidity and eliminating dust in the testing room, a big step has been taken in the additional safeguarding of perfect flying performance," says F. R. Crawford, executive vice president of the air line.

At the end of every 650-hour turn in the air, some 50 delicate flying and control instruments are taken from the control panel of a plane and subjected to ground tests and careful calibration. "This ground 'flying' plays a mighty important role in keeping those twin motors droning sweetly 10,000 feet overhead," observes A. B. Shaefer, superintendent of instruments and accessories.

"These instruments have to 'see' and 'feel' at times when human senses are handicapped."

Two instruments dominate all the other dials and gauges on the panel board before the eyes of a pilot winging over the air-lanes. These are the directional gyro, which keeps the ship on course, and the artificial horizon, which enables the pilot to keep his plane on an even keel even when he cannot see the horizon.

Equaling these instruments in delicacy and sensitiveness is the altimeter whose two-thousandth-inch diaphragm measures the pressure of the air and interprets it in distance from the earth.

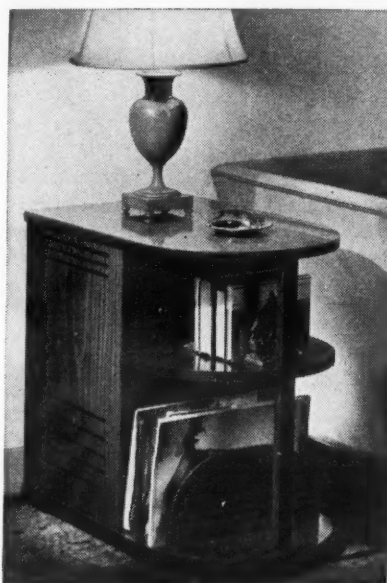
"It doesn't take much imagination," says Mr. Shaefer, "to see what would happen if dust or water got into these super-sensitive instruments while we were checking and calibrating them."

Rust used to be an even graver concern of the testers. "On a day of high humidity," Mr. Shaefer recalls, "I have simply touched a tiny part of an instrument with my finger and within a few minutes that moisture would cause rust to start forming."

Humidifier & Cleaner Built In Cabinet To Match Furniture

CHICAGO—The "Healthifier," a self-contained unit designed to humidify, purify, and circulate room air, has been announced by Lion Mfg. Corp., manufacturer of air-conditioning equipment.

Three models, all encased in cabinets to match furniture, are included in the Healthifier line: the "Sentinel,"



This "Healthifier" unit cleans and humidifies air through moisture cells. It is built to harmonize with furniture. Note intake and outlets on side.

with a list price of \$69.50; the "Zephyr," listed at \$74.50; and the "Companion," at \$76.50.

The Healthifier is a plug-in unit, said to use only as much current as a 40-watt electric lamp. Without the exterior cabinet, it is cylindrical in shape, being approximately 3 feet high and 18 inches in diameter.

Water is poured in through an inlet in the top and fills a 3-gallon reservoir in the base of the unit. A pump in the bottom of the reservoir forces water up a central tube and out into 12 arm-type distributors, each covered with a "moisture cell."

The water escapes through small holes in the distributors, and flows down the moisture cells, the latter thus being constantly saturated.

A small electric motor in the top of the unit, which operates the pump, also operates a four-blade fan mounted horizontally above the distributors.

Air is drawn in through lower grilles in the cabinet, then through holes just above the water line in the reservoir, then up between the moisture cells, and finally is forced out through grilles in the upper part of the cabinet.

As the air flows between the moisture cells, it absorbs moisture, it is said, and dust, smoke, odors, pollen, lint, and similar matter are absorbed by the wet contact surfaces of the moisture cells and flushed to the bottom of the reservoir by the constant dripping of water from the distributors.

An atomizer is provided for the use of disinfectants or scents.

Arabian Oil Workers Cooled By Ford-Driven Job

AL KHOBAR, Arabia—Life has been made bearable for a little party of scientists, engineers, and laborers at the camp of the California Arabian Standard Oil Co. on the shores of the Persian Gulf near here, by two 25-ton "portable" air-conditioning units.

Relief from the 125° F. temperature seemed impossible because the camp, of the "location" type, is miles from civilization, and consists of a series of transportable cabins, a commissary, office, and recreation hall. Each camp remains on location from three to four months.

The air-conditioning units, which are powered by Ford V-8 engines, are completely assembled on structural steel frames 11 feet 6 inches long and 8 feet wide. The units weigh 9,040 lbs. complete, and may be transported by truck.

Compressors have four cylinders, and are equipped with standard shell-and-tube condensers, one cooler supplying chilled water to the air-conditioning units at 25 to 55° F.

Orders Booked In August For Conditioning Totaled \$3,220,906, Govt. Reports

Item	Value August, 1938	of Orders August, 1937	Booked Jan.-Aug., 1938
Total	\$3,220,906	\$4,033,041	\$38,555,419
Air Conditioning Group—Total	1,292,985	1,497,987	15,275,423
Unit Systems—			
Self-contained (shipped substantially complete)....	349,067	144,976	4,566,180
Not self-contained (shipped in sections), including refrigerating or cooling medium.....	389,332	563,807	3,810,341
Central-station Systems, excluding installation if installed (including refrigerating or cooling medium sold separately or otherwise for air conditioning)*			
Human comfort	289,591	315,836	4,334,990
Industrial	33,927	45,302	417,762
Refrigerating or cooling medium sold to contractors or other distributing outlets (not manufacturing air-conditioning equipment) for air-conditioning systems, when such knowledge as to the application is available	71,338	217,609	996,780
Air washers, including pumps and motors and control where furnished	45,054	81,460	349,474
Air filters, not including sales of filters used with machinery other than fans	39,855	32,937	243,676
Humidifiers	74,821	96,060	556,220
Fan Group—Total	\$1,285,469	\$1,516,593	\$ 8,819,387
Fans, including bearings, pulleys, or couplings (if furnished)—			
For public and semi-public buildings.....	157,591	168,248	1,295,649
For general industrial uses	267,179	438,537	2,019,387
For mechanical draft	140,399	243,639	742,188
For jobbers stocks and unknown uses.....	134,047	81,530	834,574
Small housed and propeller fans—			
Direct connected small housed blowers with motors and control (merchandise motors).....	155,991	163,555	1,030,897
Propeller fans, direct connected and belted (for ventilation only)	288,603	354,013	2,070,791
Driving mechanism for general fan use, not reported above (manufactured or jobbed)—			
Electric motors and controllers.....	140,558	64,240	689,541
Steam engines and turbines.....	1,101	2,831	136,360
Unit Heater Group—Total	\$ 642,452	\$1,018,461	\$ 4,460,609
Industrial type unit heaters, including heating element and motors where furnished—			
Equipped with blower-type (centrifugal) fans....	83,923	136,955	541,029
Equipped with propeller-type fans.....	314,786	436,197	1,739,518
Schoolroom type unit heaters, including heating element and motors and control where furnished.	64,426	170,969	1,081,042
Indirect heating surface, not including unit heater surface (manufactured or jobbed)—			
Steel pipe coil type.....	1,222	4,683	11,190
Cast iron type.....	37,610	35,032	92,628
Copper or aluminum type.....	140,485	234,625	595,202

*Includes incidental equipment, such as temperature, motor, humidity, and electrical controls, dampers, outlets, etc., as are sold with each.

New Blower Has Place at Base of Return Duct

CHICAGO—A new fan unit designed for increasing the efficiency of warm air gravity heating systems has been developed by Autovent Fan & Blower Co. here.

Installed at the base of the cold air return duct at the point where

it contacts the furnace, the fan is supposed to break up air pockets in the furnace and to provide improved air distribution by forcing circulation through the pipes.

Of "booster" propeller fan type construction, the fan is equipped with patented reflector blades. It features the exclusive Autovent non-overloading characteristic and a centripetal construction said to keep the motor cool at all times.



BIG OR SMALL

WE FIT THEM ALL WITH BAKER'S COMPLETE LINE

BAKER'S complete line simplifies selling problems, for BAKER distributors can meet the specific requirements of every job, with each installation "Tailor-Made" for lasting economy of operation. BAKER offers the most complete line of air conditioning and refrigerating units on the market. 77 models for Freon or Methyl Chloride range from the sturdy two-cylinder 1/4-H.P. unit to the powerful 60 H.P. size in single machines and up to 125 H.P. in dual units. Multiple-unit installations extend the figure upward indefinitely.

With a complete franchise, BAKER distributors are prepared to handle any size installation, large or small. Consistent, hard-hitting advertising paves the way for more resultful personal selling. Skilled engineering advice and assistance are always at your command. Get full details NOW on the attractive, profitable BAKER franchise by writing to



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Branch Factories: Fort Worth, Los Angeles, Seattle. Eastern Sales: New York. Central Sales: Chicago. Sales and Service in all Principal Cities.
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Complete Copper Piping Service For All Air Conditioning Refrigeration & Industrial Work

For the "better-than-average" job, demand Wolverine Copper Tubing and Fittings!

Available in a complete range of sizes, plain or tin-plated, Wolverine Tubing is uniformly soft for easier bending, cutting and flaring. Every coil is deoxidized, dehydrated, solder sealed and crepe-paper wrapped. Types K and L in hard or soft temper, Type M, hard temper only.

Wolverine Wrought Copper Fittings also simplify your work, for they have been specially designed to make quick, sure fits. Every fitting insures the same corrosion resistance, longer life, and trouble-free service which has established the reputation of Wolverine Tubing itself.

Your Jobber Stocks Wolverine Products

See You at Booth No. 83

Refrigeration & Air Conditioning Exhibition
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WOLVERINE TUBE CO.

1477 CENTRAL AVE., DETROIT, MICHIGAN

Doctor Tells How Air Conditioning Aids Health of All Members of Family

By Albert G. Young, Ph. D., M. D.

AIR CONDITIONING in the mind of the average individual may be summarized as summer cooling. Obviously this is a mistake, but it is a misconception which must be recognized if it is to be rectified. The question then arises: Since there is such a thing as winter air conditioning what advantages has it over the usual heating system?

It can be definitely stated that winter air conditioning (properly applied) is a definite asset to the health of the family. I believe every system should have an outside air intake so adjusted that it supplies at least 25% of the circulated air.

Ducts should be large and sufficiently numerous to permit adequate heating and ventilation without demanding an air current that assumes draft proportions. Warm floors free

regarding the value of maintaining a humidity of 50 to 60% in 0° weather. Most of the purchasers have been willing to agree with Mr. Dooly when he said: "Not more than half the damn lies you hear is the truth."

We have not known what constituted the ideal relative humidity, but we do know that there is no excuse for attempting to produce too high a relative humidity in zero weather. There is much yet to be learned on this subject, but in the light of our present knowledge (or ignorance) it would appear that there is no object in raising the relative humidity above 30% for normal people and in zero weather about 20% is very effective for comfort and health.

People complain of the dry air in a warm room irritating the nose and throat. The irritation is due more

breath more easily under these conditions.

The patient with croup or laryngitis may benefit by a higher humidity, but an ordinary steam kettle in the room will add the necessary moisture without drowning the rest of the house.

QUARANTINING THE SICK

Rheumatism: The rheumatic member of the family will appreciate a warm dry atmosphere, and it is very beneficial for children with rheumatic fever. For years the standard prescription for rheumatism has been a warm dry climate. Here is an opportunity for them to enjoy it in their own home.

Infections or Contagious Diseases: Is there danger of spreading a contagious disease to the rest of the family by air conditioning? The answer is No! If the return grille is covered with oil cloth and fastened down with adhesive tape the incoming air can be vented by slightly opening the window. This will quarantine the patient just as effectively as if he were out of the house.

Noise: Two of the greatest drawbacks to urban dwellers are air-borne dirt and noise. Motor traffic, street cars, etc., create such a constant noise even in residential sections that it is a recognized menace to our public health.

By air conditioning it is possible to shut out about 90% of the city dirt and noise. If it had nothing else to offer, this alone would make it a valuable asset to public health. With our present methods of construction plus air conditioning it is possible to have quiet clean living quarters in the most congested city districts.

Oil Burning Boiler Is Added To Line By Delco-Frigidaire

DAYTON, Ohio—Officials of Delco-Frigidaire Conditioning division of General Motors Sales Corp. have just announced a new oil burning boiler, which will be known as the "quik-action oil furnace."

Principal feature of the new unit is a metal drum, or heat transmitter, which is placed around the burner flame in place of the conventional fire-clay refractory. Engineers for the company assert that a combustion efficiency not hitherto possible has been obtained by the new device.

With the metal heat transmitter in place, immediately surrounding the flame, no refractory material is necessary in the combustion chamber. The steel drum-shaped refractory reaches a temperature of approximately 1,500° within 40 to 50 seconds after the burner starts.

Radiant heat from this unit, acting directly on the walls of the boiler, is the dominant feature in the design. Metal used in the heat transmitter is of the same type used in annealing ovens.

Officials of the company state that warm-up periods on the new boiler have been reduced to approximately one eighth of the conventional required time, with corresponding elimination of fuel waste, caused by inefficient combustion.

Since a far greater percentage of the heat generated is radiant energy which is not affected by circulation, less heat is lost up the chimney.

Westinghouse Develops Portable Air Cleaner

EAST PITTSBURGH, Pa.—A new self-contained portable electrostatic air cleaner, designed especially for the relief of hay fever and pollen-asthma sufferers, but also applicable for general air cleaning in an average-sized room, has recently been announced by Westinghouse Electric & Mfg. Co.

The unit operates from the standard 115-volt outlet drawing approximately 80 watts, and circulates 240 c.f.m. of air. It may be adjusted to draw in fresh air from the outside, or recirculate the air in the room.

Approval of the unit has been given by Underwriters' Laboratories and the Council on Physical Therapy of American Medical Association. It has a newly patented design centrifugal blower, and is said to be quiet in operation and free from radio interference.

The unit depends for its operation upon the cleaning action on gases of a corona discharge. Dirt particles and foreign matter in the air are charged in an ionizing section and then precipitated on the charged plates of the dirt collector cell. Cleaning of the collector cell is accomplished by washing about every six weeks.

Airtrol Moves to New Offices

JAMAICA, N. Y.—Airtrol, distributor of refrigerating, ventilating, and air-conditioning equipment, now occupies offices in the Stuart building, 163 Jamaica Ave. here.

This is another in a series of articles written by Dr. Young, who is the medical director of the Corey Hill Hospital, Brookline, Mass. This is a completely air-conditioned hospital (most hospitals have only operating rooms or nurseries air conditioned, but Corey Hill has all rooms in which patients may be placed air conditioned).

Dr. Young's position makes him particularly well qualified to write about the medical profession's findings on air conditioning's relation to good health.

There is real selling material in these articles for all who are dealing in air-conditioning equipment, for they explain why and how air conditioning is beneficial to the good health of human beings.

of drafts will add not only to the comfort but to the health of the occupants. Good filters and humidifying equipment complete the fundamentals.

CONTROL OF SYSTEM

The success of a good installation will thereafter depend on the manner in which it is used. Since the average customer is not informed on the subject, some information should be placed in his hands explaining how he should control the system to obtain the best results.

Filters: It should be emphasized that good filters, if frequently cleaned, are healthful in city areas because they cleanse the air. Women will be interested in the effect they have on maintaining a clean house.

TEMPERATURE AND FRESH AIR

Temperature and Fresh Air: It is important to persuade the family that moving, filtered air coming through a duct is just as "fresh" and much cleaner than the soot-laden variety that blows in through the open window. Cold air is not necessarily clean or fresh, and only means extra blankets which do not add to one's rest.

It is possible in an air-conditioned home to sleep in fresh air at the same temperature as on a "balmy spring" night. The individual rests better and is more refreshed on rising.

Many colds among children can be avoided by maintaining a room temperature that requires no more covering than a sheet besides the sleeping garment. If "Junior" kicks the covers off in the night, his mother will not develop writer's cramp wiping his nose the next day.

Humidity: Much misinformation has been disseminated on this subject. Vendors of humidifying equipment have made extravagant claims

to the dust than to lack of humidity, but the added humidity will help keep the dust from rising and will be of equal benefit to the furniture and woodwork.

VALUE DURING ILLNESS

During Illness: So much for the family when they are in normal health, but what value can we attribute to air conditioning when there is illness in the home?

Colds, Bronchitis, and Pneumonia: It is definitely recognized by physicians today that cold air, either dry or moist, is irritating to patients with upper respiratory infections or pneumonia. Warm fresh air at 25 to 35% relative humidity is ideal for these patients. They cough less and

CHICAGO SEALS

FOR GENERAL REPLACEMENTS
TRIPLE PROTECTION



WORK PERFECTLY ON
SCORED or BENT SHAFTS

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WRITE FOR LITERATURE

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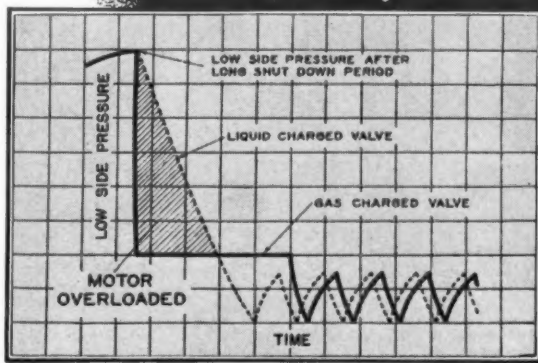
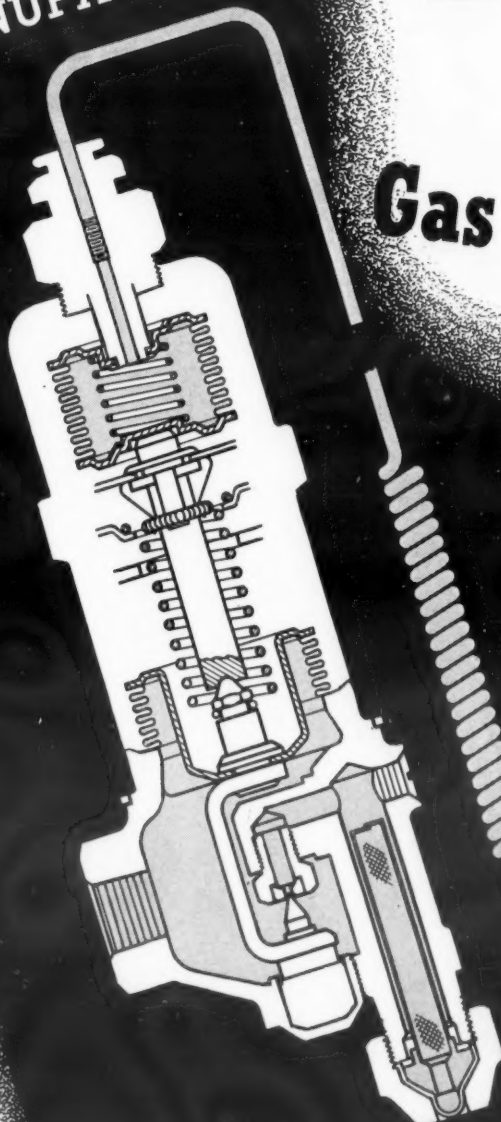
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Unit Heaters

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EQUIPMENT FOR EVERY
PHASE OF
AIR CONDITIONING

Write for Descriptive Bulletins

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MINNEAPOLIS MINNESOTA

MORE AND MORE
MANUFACTURERS



DEMAND

"Detroit" Gas Charged Valves

THE demand by refrigeration manufacturers for Detroit Gas-Charged Thermostatic Expansion Valves is steadily increasing—and for three very definite reasons:

1. **MOTOR OVERLOAD PROTECTION** because the gas-charged valve, when starting up a warm system, remains closed until the compressor has reduced the suction pressure to a predetermined point.
2. **MORE SENSITIVE OPERATION** because the gas-charge, when condensed, results in but a drop of liquid as compared to the amount regularly used in the ordinary liquid charged valve. Thus mass effect is avoided and the change from liquid to gas effected very quickly.
3. **LOWER POWER CONSUMPTION** because gas-charged valves make it unnecessary to provide heavy duty or oversized motors to take care of the overload when starting up a warm system.

In order to provide these important advantages, all Detroit Thermostatic Expansion Valves are gas-charged at carefully regulated temperatures and pressures.

These three advantages are just as important to you.

Detroit Gas-Charged Valves cost no more than the conventional liquid charged valves. Why not take advantage of this plus value! When buying valves, specify Detroit—your jobber stocks them.



DETROIT LUBRICATOR COMPANY

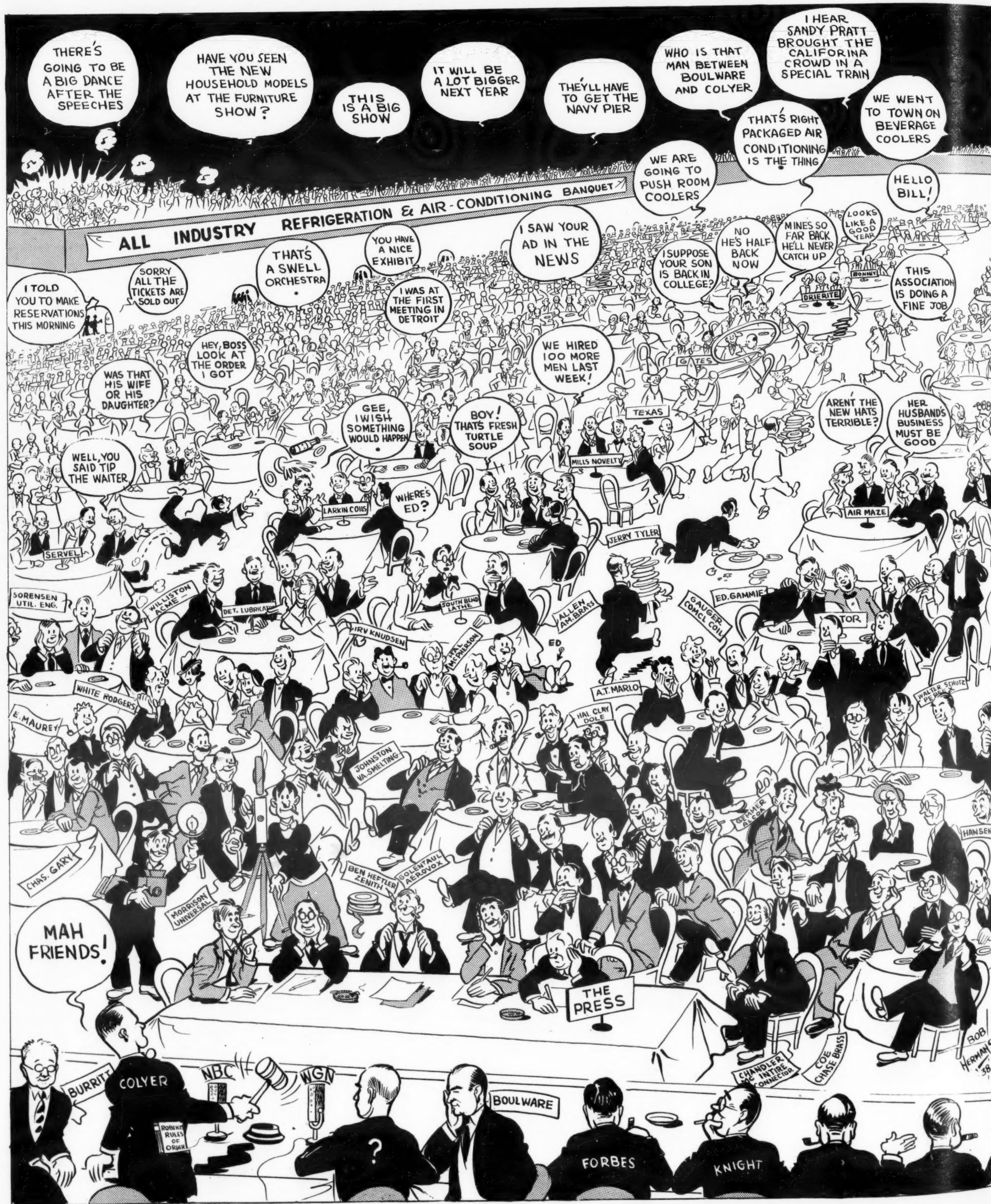
General Offices: DETROIT, MICHIGAN

Division of American Radiator & Standard Sanitary Corporation

Canadian Representatives: Railway & Engineering Specialties Ltd., Montreal, Toronto, Winnipeg

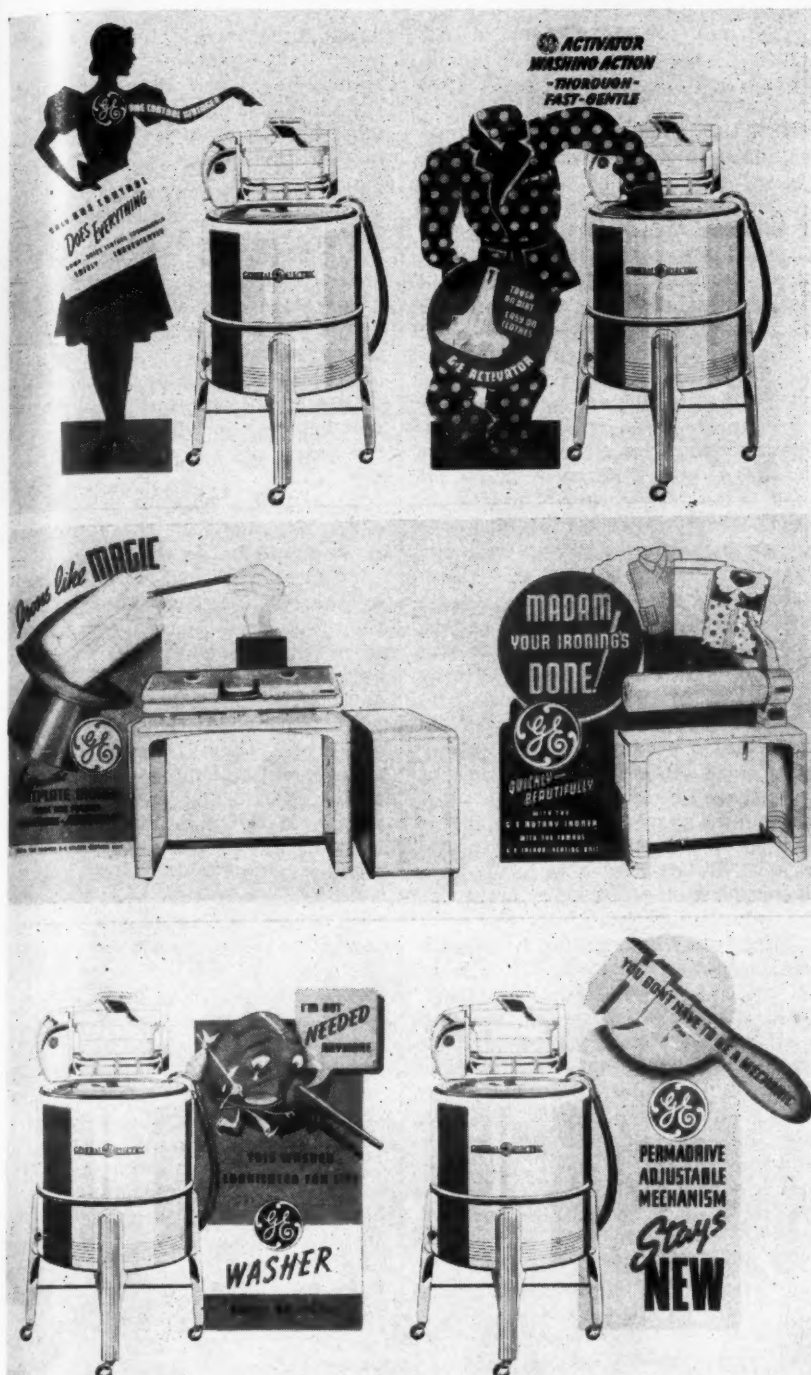
Industry Leaders Assemble In Chicago To Hear Keynote Speakers

News Cartoonist Visualizes the First All-Industry Refrigeration and Air Conditioning Banquet at the Hotel Stevens in Chicago, Monday Evening, Jan. 16. Attended by Manufacturers, Distributors, Jobbers, Dealers, Contractors & Service Men To Hear Henry W. Burritt of Nash-Kelvinator (representing refrigeration) and L. R. Boulware of Carrier (representing air conditioning) and Another Nationally Known Speaker to Be Announced Later (representing the public interest & viewpoint).



Major Appliances

To 'Shock' Public To Attention



"Sell shockers" are what General Electric calls its new series of window displays on laundry equipment, some samples of which are pictured above. Dramatic illustration and a simple theme make up the displays.

Novel, Dramatic Presentations In Modern Style Mark G-E Washer & Ironer Displays

BRIDGEPORT, Conn. — "Sell-Shockers," that's what General Electric's home laundry equipment section terms the series of eight window displays which it has devised to promote the sale of electric washers and ironers.

In the opinion of Lee Wichelns, who has charge of G-E's home laundry promotion, this type of merchandise has long suffered from the attempt of manufacturers to tell the whole feature-laden washer-and-ironer story in one display, so the eight "Sell-Shockers" have been designed specifically to correct this condition.

A dramatic illustration and, where possible, a single word, was devised

to call attention to each of six important washer features. A scarlet-clad girl in silhouette points to the one-control wringer; a weeping oil can bewails lifetime lubrication; an enormous cat exemplifies quiet operation; a huge monkey wrench symbolizes trouble-free mechanism; and a giant hand stamps the guarantee.

The same principle is employed in the ironer displays, one display each being devoted to the flatplate and rotary ironers.

Throughout the series, which is intended to run for eight months at the rate of one display per month, simplicity has been the keynote. Copy has been cut to the bone.

Manuals Now Available For Salesmen's Use In Special Range & Water Heater Sales Drive

NEW YORK CITY—In connection with its October "Discovery Month" drive, Modern Kitchen Bureau has issued a pair of brief manuals for use by salesmen in selling electric ranges and water heaters.

Range manual is titled "A Star Salesman's Recipe For Cooking Up Electric Range Sales," while the other booklet lets "Charley Water Heater" speak for himself, after the manner of another famous "Charley" of radio and movie fame.

In the range sales manual, the "star salesman" suggests the following essential ingredients:

The average cost of electric cooking in his community, obtained by the salesman from his local power company.

Actual cooking costs in his community, obtained from customers to whom he has previously sold ranges.

Use of these local figures to chase the bogeyman of high cost.

Presentation of the labor-saving and money-saving cleanliness of electric cooking; with further emphasis on its speed, and the convenience and economy of oven meals.

In the second booklet, the water heater salesman who acts as "Charley's" stooge leads the water heater into an explanation of how it sells itself. "Charley" then goes on to tell how popular he is because of his convenience, his neatness, his handsome appearance—and disposes of the question of expense by pointing to decreasing utility rates and to his own economy. The booklet is called, "The Electric Water Heater Speaks For Itself."

Copies of the booklets are available from Modern Kitchen Bureau headquarters here at 5 cents each.

August Vacuum Cleaner Sales Gain Over July

CLEVELAND—An increase of 32% over the July figure was shown by August sales of electric vacuum cleaners, the total number of units sold in August being 90,557, reports the Vacuum Cleaner Manufacturers' Association.

The August sales, however, were 22% below those of August, 1937, the report shows, and sales for the first eight months of the current year were 30% below those of 1937.

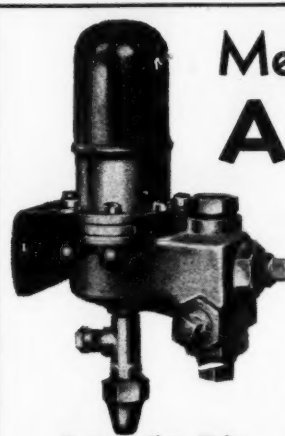
Average retail price for floor models, Mr. Frantz reported, was \$57.23 in August this year, and \$55.93 in August, 1937. For the respective eight-month periods of 1937 and 1938, average retail prices were \$54.91 and \$60.07.

Plumbers Must Install Heaters In Kansas Town

KANSAS CITY, Kan.—Electrical appliance dealers and plumbers are cooperating in the sale and installation of electric water heaters under this city's new electrical code.

Plumbers must install all water heaters and put on pressure relief valves, according to the new code. To boost sales, appliance dealers are offering plumbers a commission on all water heater sales they help close, the amount dependent upon size and price of the installation.

It is a natural coordination of activity, appliance men feel, which should result in greater goodwill and an increased volume of sales.



Snap Action Valve

Ask about our
Expansion Valves
Dehydrators
Filters
Check Valves and
High Side Floats
VACUUMATOR

Meet some members of the AMINCO

family—A sturdy group of performers in the refrigeration and air conditioning industry, with an outstanding record of performance on any job within their range.

Aminco products are carefully designed, skillfully manufactured, and backed by a positive guarantee of satisfaction.

A reputation of 55 years standing is behind every Aminco product, and constitutes the most convincing reason for the wide popularity enjoyed by our house.

AMERICAN INJECTOR COMPANY

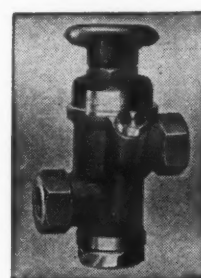
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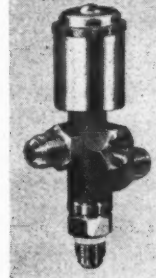
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VAN D. CLOTHIER
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Water Regulating Valve



Automatic Suction Pressure Throttling Valve



Constant Pressure Valve



Automatic Oil Separator

THE NEW BLACKSTONE WASHER

A NEW LINE WITH MANY NEW FEATURES



including

BONDERIZING

In addition to perfected construction and advanced styling, Blackstone uses a modern finishing system that protects their washing machines against rust and assures longer life for the lustrous enamel finish.

Bonderizing under the enamel assures a secure foundation for the finish and shields the metal from moisture.

Bonderizing is a hidden quality that must be explained by the salesman. Fine appearance is a forceful sales point and assurance that original beauty will be retained through years of service appeals to the careful buyer.

This finishing system gives the Blackstone Washer a finish in keeping with the sturdy construction and rugged mechanical features.

PARKER RUST-PROOF COMPANY
2197 EAST MILWAUKEE AVE., DETROIT, MICH.

PARKER
Processes CONQUER RUST
BONDERIZING • PARKERIZING

Bonderizing section in the Blackstone plant

Swedish Industrial Executive Provides Formula For the Coordination of Sales and Production Planning

WASHINGTON, D. C.—"Coordination of production and distribution is an organization problem, which falls within the scope of general management, and is one of the most important problems of industrial management," declared Nils A. Sterner, assistant general manager of the L. M. Ericsson Telephone Co., Stockholm, Sweden, in addressing the International Management Congress here recently.

Mr. Sterner told how the production and distribution departments of an industrial firm should function, and how their activities should be coordinated so that the public is satisfied and the business is profitable.

"There are two and only two primary functions in industry; they are production and distribution—all other functions including financing are auxiliary to these two," declared the speaker.

DEPARTMENTAL FUNCTIONS

"Let us first consider what shall be coordinated and why," began Mr. Sterner. "The sales department's first aim is to sell, and the best result of a given effort will be derived if the goods to be sold are adapted to their markets as regards price, quality, design, style, color, preparation, and service or, in other words,

if they are attractive to the public.

"The manufacturing department, on the other hand, will reap the best result from its efforts if it is allowed to produce the goods and the quantities of them which the factory is equipped to make.

"Effective management must concern itself with the things the consumer wants and at the same time try to comply with the requirements of the factory."

The problem of coordination between distribution and production arises, said Mr. Sterner, when consumer demand does not agree with what the plant is prepared to make. Complete harmony practically never exists, because consumer demand changes while factory equipments with the exception of current improvements only change as a result of impulses from outside.

ONE CANNOT PREDOMINATE

Distribution, under the influence of changing consumer demand, is dynamic, while production, in consequence of the capital expended in preparation work, and in equipment, is static.

"Neither of the two functions may be allowed to predominate," declared the speaker.

"If the distribution side gets all it wants the production equipment is

likely not to be utilized sufficiently for a good result and, generally speaking, the production tends to become too expensive.

"On the other hand, if the production side predominates, the distribution task will be difficult or impossible to perform with an acceptable result, because the consumer demand is likely not to be satisfied. The two sides must be coordinated."

The first instrument of industrial planning, according to the Swedish industrialist, is a sales forecast based upon knowledge of all the factors which influence or can be brought to influence sales. Both the production schedule and the sales plans must be based upon the sales forecast, which in its turn has taken into account consumer demand as the most important factor and also the factory's ability to correspond to it.

The sales forecast and the production schedule converted into money are the determining factors for the elaboration of the departmental and the company budgets, which are the compasses for the coming period. There should at all moments exist a detailed budget for at least as long a period as is needed for preparation of production and for production proper of the goods.

"Often budgets are made only once a year, in December, for the coming financial year; such budgeting has, of course, very little value for planning purposes," said Mr. Sterner.

PURPOSE OF THE BUDGET

The budget, both in money and translated into activities, represents the general management's will and is to be regarded as an order, the performance of which will be strictly controlled. If everyone does his part, the profit budgeted for will result; if performance does not bring about the budgeted figures, investigation must be made and new measures to get the desired profit must be applied.

Two kinds of sales forecasts should be made, said the speaker, the one a short term forecast, the equivalent production side of which is the production schedule, and the other a long term forecast, which is used for the planning of factory equipment and as a guide for industrial research and development.

'DEMAND NOT ETERNAL'

Mr. Sterner emphasized the importance of planning factory equipment, including tools, for a determined consumer demand and for a determined duration of it. Consumer demand for a specific article is not eternal, he said, but the corresponding factory equipment often seems to have been planned for eternal use. This is waste of capital and not good management.

Delegation of responsibilities in connection with the elaboration of budgets and with their fulfillment is very important, the speaker pointed out. Thus the sales department must feel and really be held responsible for the fulfillment of the sales forecast and the budget figures based upon it. The manufacturing department on its side must be held responsible for fulfillment of the production schedule and the budget figures based upon it.

BOOKKEEPING'S FUNCTION

Bookkeeping and other means of budgetary control should be organized not only to give direct control but also to give useful indications of measures to be taken. In other words, the budgetary control must tell us not only that things are going well or badly and to what extent, but also where and as far as possible why.

"Every activity in industry is induced by public demand, the manifestation of which is the order," declared Mr. Sterner. "The demand and the order must be anticipated by the manufacturer."

"The anticipated order is used for budgeting purposes including elaboration of the production schedule and the sales plan. Orders received, if anticipated, confirm the forecast and there is nothing more to be said about them in this connection."

"Those orders which have not been anticipated cause revision of the production schedule or the sales plan but their effect on profits is, as a rule, a favorable one. On the other hand, if anticipated orders are not subsequently covered by actual orders, idle plant or increased stock are the consequences."

"Actual orders as compared with

the anticipated orders are the first test of how the budget corresponds with reality, or, in other words, the first budgetary control."

"When speaking about orders it must be borne in mind that the significance of them is not the same from the distribution point of view as from the production point of view. In distribution the orders represent so and so many pieces worth so and so much money, but in production they signify so and so much material and so and so big a part of the equipment capacity. A conversion between both is made when budgeting."

"But the sales department must continually know with relative exactitude and in easy fashion the extent to which the producing capacities of the different plant units are being utilized, how prospective orders will charge the different plant units and what times of delivery can be promised for different kinds of goods."

"The main instruments for this are periodical reports from the manufacturing department, preferably expressed in cost figures, a table showing the normal time for production of different kinds of goods and another table showing in percentage how each kind of goods charges the different plant units."

RESISTANCE TO CHANGE

"Production has a natural inclination to resist change, whereas distribution is more disposed to follow the wishes of the consumer. The initiative in the modification of an article under production or in taking up the production of a new article or of a new line of articles in most cases comes from the distribution side as a result of its contact with the market. But it may also come from the production side as a result of pure research."

"Different industries need different methods but a short description of our method might be of interest. When it is felt that modification of an article should be made or a new article or a new line should be taken up, the sales department has first to carry out a market study in order to ascertain how the article should look, how it should function, what it should cost, and so on, and to give its opinion about the market such an article would have."

"Then the technical department, in cooperation with the manufacturing department, gives its opinion about

the possibilities and cost of designing and producing just the wanted article or a modification of it if deemed necessary."

"At this stage general management is in possession of all elements necessary for judging whether the development work should be proceeded with or not. If it is decided to proceed, the necessary funds are put at the disposal of the technical department."

"However, even during the actual development work intimate contact must be maintained between the engineering and the distribution sides because in development it is in most cases found necessary to make modifications of the original plans and these modifications often change the value of the article to the consumer."

"Approval of the product as regards quality, design, style, color, preparation, and service, or in other words of the relation of the product to its market, must come from the distribution side. But this is only one of the conditions that must be satisfied before a product can be offered for sale."

HOW SWEDES DO IT

"A summary of the main conditions would be as follows:

"A technical description approved by the sales department is the basis for the manufacture of a small number of the article for testing and for costing purposes."

"After completion of the tests, which in some cases include trial sales and tests by the consumers, with modification of the design accordingly and also to conform to the wishes of the manufacturing department a new technical description can be issued."

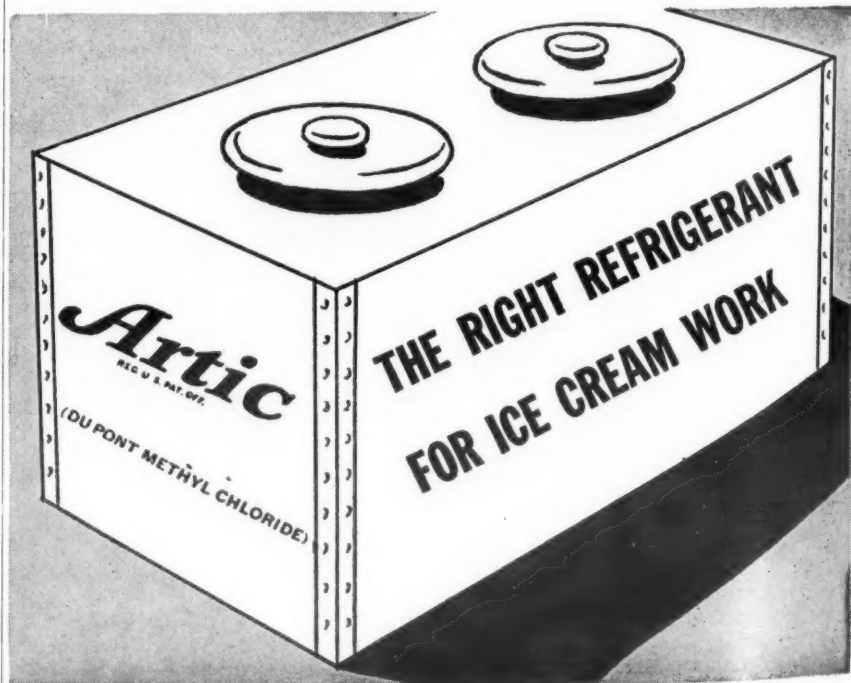
"This description, the calculated cost and the anticipated turnover comprise the elements necessary for the planning of the tools. At the same time catalog description and preliminary sales instructions are made and a provisional price is fixed by the sales department. Now a new trial manufacture and a trial sales campaign are possible."

"Following the experience thus obtained the new article may be given its definite shape and the definite catalog description, definite sales instructions, sales plans, definite propaganda material, and so on may be elaborated. The article is ready for sale."

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DETROIT



IT'S a quick-cooling refrigerant, permits rapid production of "smooth" ice cream. It gives controlled low temperatures, easily and efficiently, so that ice cream can be held at proper cold before dispensing. That's why it's so widely used in ice cream and dairy cabinets. Recharge these units with the dependable Methyl Chloride—ARTIE—specified and used by leading manufacturers for over 16 years.

Stocked in principal cities in standard containers for prompt delivery. Send for "ARTIE Service News"—valuable servicing information, list of distribution points, etc.



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ARTIE—The preferred Methyl Chloride for service work

Service News

Proposed Detroit City Ordinance Would Prescribe When Operator Is Required For a Mechanical Cooling System

(Concluded from Page 1)

their assistance in the completion of a workable ordinance.

The tentative ordinance follows:
AN ORDINANCE to provide for the licensing of Refrigeration Engineers and Operators of Refrigeration Systems in the City of Detroit, Michigan.

The following refrigeration systems shall be in charge of licensed Refrigeration Engineers, First or Second Class Steam Engineers or Refrigeration operators:

(a) All systems powered with a prime mover having a standard power rating of more than twenty-five (25) horsepower or an overload which raises the power rating above 25 horsepower.

(b) All systems in Institutional and Assembly occupancies powered with a prime-mover of more than five (5) horsepower, standard rating or an overload which raises the power rating above five (5) horsepower.

(c) All manually or semi-manually controlled systems having a prime mover of more than five (5) horsepower, standard rating or an overload which raises the power rating above five (5) horsepower.

LIMITS CERTAIN GASES

(d) All systems having a prime mover of more than five (5) horsepower, standard rating and containing a toxic or inflammable refrigerant or an overload which raises the power rating above five (5) horsepower.

(e) All systems in series or in parallel having prime movers in the aggregate of more than twenty-five (25) standard horsepower rating as designated in (a) or more than five (5) horsepower rating as designated in (b), (c), and (d).

A Refrigeration Operator's license shall be limited to systems having a prime mover of not more than twenty-five (25), standard rating horsepower and to types of refrigerants with which the applicant is familiar provided such license shall not cover a system powered with a steam driven prime mover.

A Refrigeration Engineer's license shall be unlimited as to size, type of system, or refrigerant.

Such license shall not cover a system powered with a steam driven prime mover.

A First and Second Steam Engineer's license shall be unlimited as to size, type of system, refrigerant, or type of prime mover.

LICENSING PROVISIONS

Provisions for the licensing of First and Second Class Steam Engineers shall be such as are provided for in Chapter 184 of the Compiled Ordinances of 1936.

Applicants for Refrigeration Engineers' and Refrigeration Operators' licenses shall submit to the Department a sworn affidavit showing the time and place he has been employed at such work, the types of systems operated, the types of refrigerants used, and by whom employed. After an application is filed and before a license is granted, the applicant shall pass an examination, satisfying the Department that he is qualified to operate such systems as the license applied for will allow.

An applicant shall have been a resident of the State of Michigan for at least one year immediately preceding the filing of his application.

Applicants failing to pass the examination for a certain grade of license shall not be permitted to take an examination for the same grade in less than 90 days.

Applicants for Refrigeration Engineers' licenses shall have had at least three (3) years' experience in the operation or construction of refrigerating systems and shall be subjected to a written and oral examination.

For graduates in mechanical or refrigeration engineering, from a recognized school of technology, two years' experience in the operation or construction of refrigerating systems shall be accepted.

EXPERIENCE NECESSARY?

Applicants for Refrigeration Operators' licenses shall have had at least one (1) year experience in the operation of refrigeration systems and shall be subjected to an oral examination.

Refrigeration Operators' licenses shall not be transferred from one plant to another without the approval of and recording with the Department.

Applicants for licenses shall be at least 21 years of age.

Licenses shall be renewed annually.

A Refrigeration Engineer's or Refrigeration Operator's license may be revoked by the Commissioner for incompetence, neglect of duty, failure to keep apparatus in charge in good working condition, or for leaving his post of duty while on watch.

Licensed Engineers or Operators of refrigeration systems, where required by this ordinance, shall be in direct charge of the system or systems at all times such system or systems are in operation and shall be responsible for no other duties which may detract from the time or attention required for the safe operation of the system.

RESTRICTS OWNERS

If any owner, lessee, or other person shall operate or cause to be operated after the passage of this Ordinance, any refrigeration system

or equipment attendant thereto in the City of Detroit without having complied with the requirements of this Ordinance, or shall keep in use any refrigeration system or equipment attendant thereto after receiving notice from the Department and having been given an opportunity to be heard by the Board of Rules of the Department subject to review by the proper Court, relative to the notice of violation or condition, or any foreman, manager, or employer requiring or allowing an engineer or operator in his employ to absent himself from his post of duty, he or they, severally, shall be deemed guilty of a violation of this ordinance.

Fees for licenses shall be such as are provided for by the Board of Rules.

Fees shall be paid to the Bureau of Licenses and Permits of the Department.

DEFINITIONS

For the purpose of this ordinance, the following definitions shall apply:
Commissioner. The Commissioner of the Department of Buildings and Safety Engineering.

Department. Department of Buildings and Safety Engineering.

Board of Rules. The Board of Rules of the Department of Buildings and Safety Engineering.

Refrigeration System. A combination of interconnected refrigerant containing parts and equipment attendant thereto in and by which refrigerant is circulated for the purpose of extracting heat.

Public Assembly Occupancy. Public Assembly occupancy shall mean a building or that portion of a building in which persons congregate for civic, political, education, religious,

social, or recreational purposes; including, among others, auditoriums, assembly rooms, armories, ball rooms, bath houses, broadcasting studios, colleges, court houses without cells, churches, dance halls, department stores, exhibition halls, fraternity halls, lodge rooms, mortuary chapels, museums, schools, libraries, passenger depots, subway stations, bus terminals, theaters, and similar occupancies.

Institutional Occupancy. Institutional occupancy shall mean a building or that portion of a building in which persons are harbored to receive medical, charitable, educational, or other care or treatment, or in which persons are held or detained by reason of public or civic duty, including, among others, hospitals, asylums, sanitariums, police stations, jails, court houses with cells, and similar occupancies.

Parallel connecting systems. Where two or more compressors have their suction lines connected to a common suction header and their discharge lines connected to a common discharge header.

Repeal of previous ordinances. All previous ordinances or portions of ordinances inconsistent with or conflicting with the provisions of this ordinance and all amendments thereto, are hereby repealed.

PENALTIES

Penalty of Violation. Whenever any person shall violate any of the provisions of this ordinance, either personally or by conspiring with or causing others to commit acts in violation of this ordinance, he shall be deemed guilty of a misdemeanor and shall be fined not to exceed one

hundred dollars (\$100.00) or confined to the Detroit House of Correction for a period not to exceed thirty (30) days, or both, at the discretion of the Court. Every such person shall be deemed guilty of a separate offense for every day on which such violation shall continue.

Validity. Should any article, section, paragraph, or provision of this Ordinance be declared by the Courts to be invalid, the same shall not affect the validity of the ordinance as a whole or any part thereof.

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THEY'RE DRY... as proved by their dielectric strength of 25,000 volts. And you can KEEP them dry... because Capella Oils now come in refinery-sealed and re-sealable 5- and 1-gallon containers.

Refrigerator service men using Texaco Capella Oils report "protection against absorption of moisture, uniformly free flow at sub-zero temperatures, remarkable stability, and resistance to sludging in contact with modern refrigerants."

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Trained lubrication engineers are always available for consultation on the selection and application of Texaco Capella Oils. Prompt deliveries assured through 2108 warehouse plants throughout the United States.

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Commercial Service

Here Is First Article of Series On Soda Fountain & Ice Cream Cabinet Servicing

Installations of soda fountains, ice cream cabinets, and counter-type ice cream freezers represent an important part of the market for the services of refrigeration service engineers and installation contractors. Low-temperature display cabinets for frozen confections and quick-frozen foodstuffs of all kinds are beginning to loom up as an important part of the service and installation man's business.

The following article is the introduction to a contemplated series of articles which will take up installation and service problems on soda fountains, ice cream cabinets, counter-type freezers, and low-temperature display cases.

In the contemplated series, it is planned to describe the characteristics of various types of equipment in each classification, from the early models right up to the present, and to provide detailed information about installation and service methods for each type.

By Arch Black and Dean C. Seitz

EVERY refrigeration service organization is in business for one purpose—namely to make money. Its primary function is to sell its service to every possible prospect.

When manufacturers wish to increase their sales possibilities and consequently their profit possibilities, they increase their line, their scope of activities, and reach new markets in which they had never before attempted to sell.

One of the purposes of this proposed series of articles is to present to the service organization ways and means of entering new fields, all of which, though associated with their main business, will offer new possibilities for revenue and expansion.

The fields that are open for the

service man to expand in are many. Undoubtedly he has considered some branches of refrigeration highly specialized and rather hazardous to enter. However, he will find that these specialized branches of refrigeration require very little more technical information than that now possessed by the average service organization. A knowledge of the principle of the systems and the product in general is essential.

As a possible source of more business for the service organization, the first field of activity that we will consider is that of the low-temperature fixtures; such as soda fountains, ice cream freezers, ice cream hardening cabinets, dispensing cabinets, and frozen food cabinets.

First let us take up soda fountains:

Soda fountains are considered by many to be a complicated hook-up of low-temperature work and high-temperature work. Actually a soda fountain is one of the most simple of the multiple applications of refrigeration systems.

However, it is necessary that service men understand thoroughly the refrigerating principles, the operation, and the service methods for all makes of soda fountains before they offer their services to either the manufacturer or the owner of a soda fountain.

It is particularly important, for example, to understand the proper valves used in multiplexing soda fountains.

FIRST GET KNOWLEDGE

The service man should first equip himself with the necessary knowledge so that he can tackle any soda fountain installation or service problem, and then know enough to sell the knowledge which he possesses.

He must bear in mind that the individual who buys a new soda fountain knows nothing whatever about how it should be erected, installed, or serviced.

Why shouldn't the service man offer to erect and install his soda fountain, to install his refrigeration equipment, to set the controls and check them, to service his equipment on an annual inspection fee basis, plus the necessary supplies and labor for actual service work?

Why let the owner of a soda fountain obtain his carbonator service from one organization and his refrigeration service from another? Why not learn the fundamentals of carbonators and offer this service yourself? Why not learn the operation of soda fountains, how to repair them, how to stop them from leaking, and offer this service yourself?

OFFER COMPLETE SERVICE

The service man has a much better opportunity of having an owner's entire business if he can offer him a complete service on his entire equipment, than if he is merely the "refrigeration service man."

Summarizing the above, if the service man wishes to accomplish the purpose of increasing his business, he must know the technical problems inside and out and offer a complete service not only on refrigeration but also on the other serviceable items on the equipment, such as carbonators, draft arms, etc.

There is an incorrect impression that manufacturers of soda fountains are now offering this service themselves. Only those very few

manufacturers who have national sales and service organizations are able to offer this sort of service.

The proposed series of articles are to tell the service man exactly what he should know about soda fountains, ice cream freezers, and frozen-food cabinets—the points he must know to install and service, and at the same time to give him the information that will help him sell his service either to the manufacturer of equipment, or to the user.

What are the problems of ice cream freezers? The main problem of an ice cream freezer, from the user's standpoint, is not refrigeration. He is worried about how to make ice cream.

He purchases ice cream freezers to give him a profit. He can only obtain his profit if he gets the proper percentage of over-run in his ice cream. How does he get 100% over-run in his ice cream? When he does not get it, he looks to some specialist to tell him how to do it.

PROFIT OPPORTUNITIES

If in your territory you were capable not only of servicing the refrigeration portion of an ice cream freezer, but also knew and could tell a customer how to get over-run, or how to make chocolate ice cream, or how to make nut or fruit ice cream, you would be in a position to render service for the manufacturer.

Manufacturers of ice cream freezers would be glad to have your name on the list so that they could look to you for such assistance as they need from time to time in the field, and just such services as these.

How would you know if the freezing time of an ice cream freezer is too long? Suppose the job was not short of gas; suppose the operating back pressures were correct and the freezing time was still too long. Could you account for it?

FACTORS IN FOUNTAINS

Do you know the other factors, outside of the mechanical operation of the refrigerating machine, that will cause long freezing time? Do you know that scraper blades in an ice cream freezer must be sharp, in order to remove any ice cream which forms and freezes on the inside wall of the freezer's lining? Ice cream actually frozen on the inside lining of the shell of a freezer is a good insulator, and the freezing time will naturally be longer if an eighth of an inch of ice cream were frozen solidly on the inside lining. Could you tell the customer how to sharpen his blade?

There will probably be some refrigeration angles that you will never

have encountered unless you have wide experience on ice cream freezers. What is the most satisfactory way of removing moisture from any low-temperature fixture operating at zero degrees or below? Remember that any moisture in the low side will probably be frozen in the form of ice. How are you going to get it out of the system?

In a self-contained ice cream freezer, the space allowed to the refrigerating machine is seldom more than absolutely necessary, and space available for servicing is usually quite cramped.

Suppose you found it necessary to install a filter or dryer and leave it in the system for several days. The customer would certainly not want you to leave the compressor enclosure off the job. He will insist on it being in place. Where would you put the dryer?

WARM AIR PROBLEM

Did you know that there are certain places in the enclosure where the dryer should not be placed? Certain motors have the end bell slotted for forced air circulation through the motor itself. The heat that passes through the end bell of the motor is quite high; in fact it is warmer than the air leaving the condenser. If this warm air from the motor is allowed to pass over the dryer the front of the dryer will become quite warm, in fact so warm that when the machine stops, pressure built up in the filter will be slightly higher than the pressure in the receiver.

As a result, the liquid refrigerant will flow backwards from the filter or dryer into the receiver. The first time the refrigerating machine starts or the expansion valve opens, gas will be there, and high-pressure gas will be passed into the low side, due to the fact that the filter or dryer has become gas trapped.

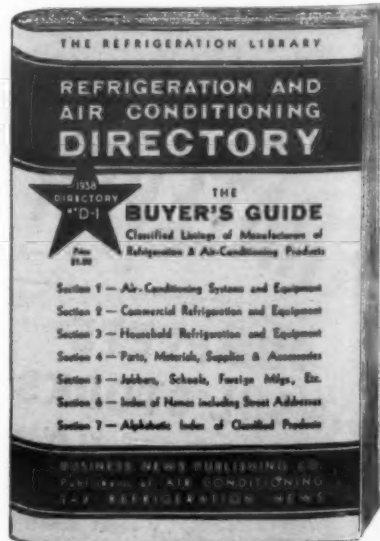
HIGH VELOCITY

If high-pressure gas has passed through the expansion valve, it is most likely that the front line will move out quite far, and even the crankcase will become frosted within the first few minutes of operation. This is due to the high velocity of the gas passing through the expansion valve, pushing the refrigerant standing in the low side ahead of it. The chances are that the average service man, seeing this condition, would immediately change the expansion valve or endeavor to adjust it.

His mistake would be that of not measuring by hand the temperature of the receiver, compared with the temperature of the filter. If he found the filter or dryer at a higher temperature than the receiver, his real service job is to remove the filter or dryer from its present location, and put it inside the enclosure where its temperature and the temperature surrounding it will not be higher than the temperature of the

(Concluded on Page 29, Column 1)

The Buyer's Guide of the Refrigeration and Air Conditioning Industry



The 1938 Refrigeration & Air Conditioning Directory No. D-1 gives a complete, classified listing of all manufacturers of refrigeration and air-conditioning equipment, parts, materials, supplies, and accessories. The companies are classified by the products they manufacture and also alphabetically. Jobbers of refrigeration parts and supplies and foreign manufacturers are also listed. Directory No. D-1 contains 252 pages.

Price Reduced to 50 Cents Per Copy
Business News Publishing Co.
5229 Cass Ave., Detroit, Mich.

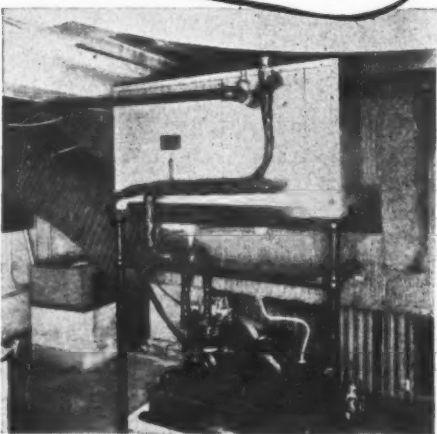


*Restating the Facts
About Wagner Motors
That Make Them Beneficial
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✓ **SUPERIOR PERFORMANCE** characteristics are the result of careful design, and precision in manufacture. Wagner motors meet the exacting requirements of your air conditioning apparatus since they are available in a wide range of designs with excellent performance characteristics, such as high starting torque, low starting current, high overload torque, smooth running operation, etc.

✓ **DEPENDABLE AND SATISFACTORY OPERATION** means that a motor will operate quietly and smoothly for a great many years without failure. The dependable and satisfactory operation for which Wagner motors are recognized as outstanding by the air conditioning industry results from 47 years of practical application, careful research, and intelligent engineering to secure the combination of factors that make Wagner motors superior to other motor designs.

✓ **INHERENT RUGGEDNESS AND COMPACTNESS OF DESIGN** are features that make Wagner motors particularly desirable for air conditioning equipment. Stator frames are of rolled steel—strong, rigid, will not get out of alignment. Well-insulated and carefully treated windings are securely wedged in place. Concentrically-machined end-plates and diamond-bored bearings. Dynamically balanced rotors. Bases formed from steel plate.



A typical air conditioning installation in the basement of a store in New York City. The refrigerant compressor is driven by a Wagner 5 hp, type RP, squirrel-cage polyphase motor. Since user satisfaction is paramount, the dependable performance of this Wagner motor assures its success.

✓ **ACCEPTANCE** by leading air conditioning manufacturers after careful and thorough examination of Wagner motors, along with competitive makes, attests to their ability to give dependable service and user satisfaction. Wagner Sales Department will be glad to furnish you with names of air conditioning equipment manufacturers who are using Wagner motors.

The above facts warrant your careful consideration of Wagner motors. Don't overlook the advantages these motors can add to your air conditioning equipment. Write today for your Wagner motor literature. No obligations involved.

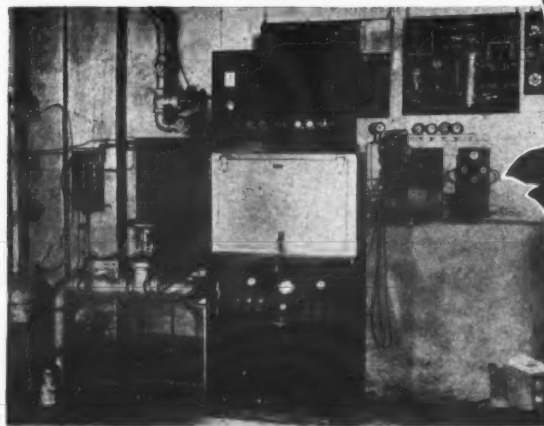
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THIS carefully-planned and well-built master test panel has done plenty to increase Service Department efficiency at the General Equipment Corporation, Boston, Mass.

Any shop can be made more efficient and profitable by improving its testing equipment.

And the refrigerant you use in servicing is important, too. In his letter describing the details of his test panel, Mr. Lehan says, "Our entire supply of refrigerants used in our Service Department is obtained through the facilities of the Virginia Smelting Co., to whom we wish to express our sincere appreciation for prompt service and satisfaction."

Service engineers all over the world depend on Virginia Extra Dry Esotoo and V-Meth-L for Prompt Delivery as well as Quality.

Send a postcard for any or all of the following: Details of the test panel illustrated, or our booklets "Refrigerant and Lubricant Data" and "Tabulated Properties of Various Refrigerants."

EXTRA DRY ESOTOO • V-METH-L
VIRGINIA SMELTING CO., West Norfolk, Virginia

First of Service Series To Cover Boiler-Type Soda Fountains

(Concluded from Page 28, Column 5)
receiver itself. Only in this way will it be possible to prevent the liquid refrigerant from going backward each time the refrigerating machine starts.

This is just an example of the type of information which a service organization must have at its finger tips to be able to intelligently handle a specialized service on freezers.

A large number of the frozen food cabinets sold by the manufacturers of those cabinets today are sold on a plan which gives the customer one year service. The service man can contract with the manufacturers of these cabinets to render this service.

What do you need to know about frozen food cabinets in order to be able to render this service? What type of contract should you enter into with the manufacturer of the equipment? What questions is he likely to ask you at the time that you are endeavoring to sell your service to him? How much money should you ask him for a contract on servicing a frozen food cabinet?

Did you know that proper service on a frozen food cabinet is one of the most important factors? Did you know that frozen foods, if they are permitted to defrost, are practically useless and worthless? The average frozen food cabinet holds \$30.00 worth of wholesale price merchandise, so it is highly important for the service man to get to this cabinet promptly if the user calls him for service.

The authors intend to provide information on specialized fields in which you can increase your business opportunities, and will try to give you not only the features of construction of equipment which you must understand, together with valuable and complete service information, but also to provide you with the sales tips which will afford you the opening to sell your merchandise, which is service.

Service engineers do more than any one single group, with the possible exception of the sales organization itself, to make it possible to build successfully a profitable volume of business or make it an entire failure. No matter how well constructed or how fine the quality of the equipment may be, it will not operate properly nor give customer satisfaction unless a successful installation is made and satisfactory service rendered during the life of the equipment. Without the latter, the best sales methods will be unavailing.

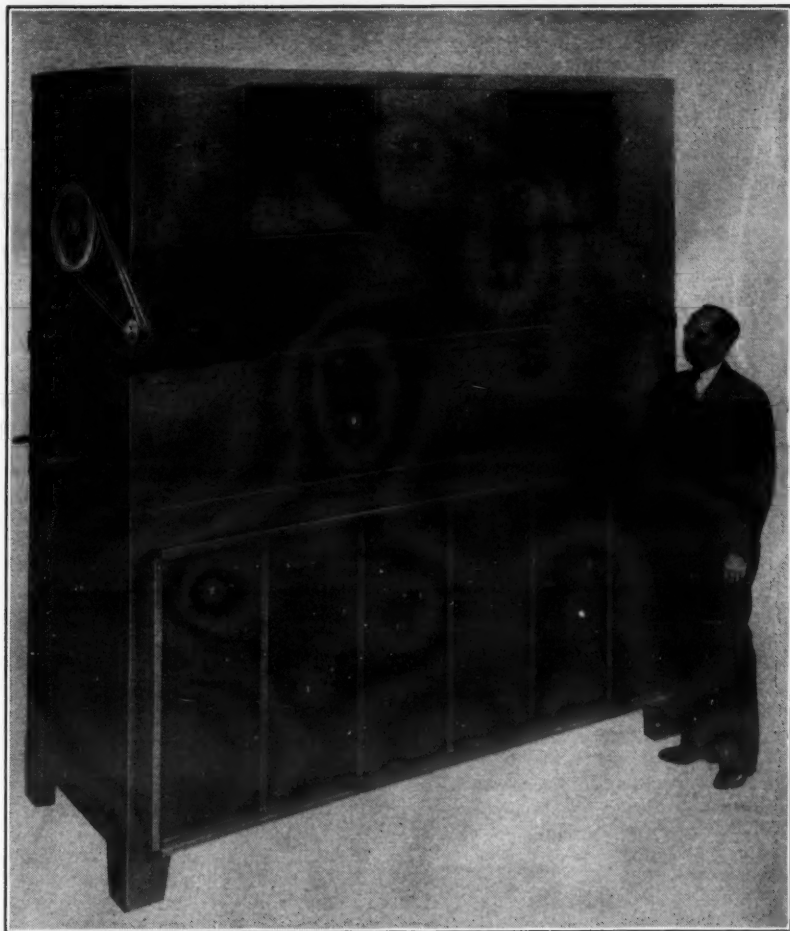
It is intended that the first series of articles will be on soda fountains. The construction, operation, installation, and servicing of the early boiler-type soda fountains will be discussed first.

Booklet Is Descriptive Of Bearings, Bushings

DETROIT—A profusely illustrated booklet describing the various types of engine bearings, bearing liners, and bushings in general use, the newer types now being more extensively used, and the methods of design and manufacture, has been published by Federal-Mogul Corp., bearing and bushing manufacturer here.

Picturing a wide variety of modern bearing and bushing applications on machines and appliances, the booklet discusses the advantages of applying designs and alloys developed in automotive practice to modern machines.

Peerless' Newest Floor-Type Conditioner



M. W. Knight, sales manager of Peerless of America, Inc., inspects the floor-type air conditioner, newest member of the Peerless family. The unit, which has a capacity up to 40 tons, is of the complete cabinet type, consisting of casing, coil, blowers, motor, and filters. Peerless "high dispersion" coil is used for both direct-expansion refrigerant and water circulating installations. Pressure-type blowers are used, and units can be built for either top or side discharge of air.

Scholarships Given by Utilities Institute

CHICAGO—Free scholarships are being offered by Utilities Engineering Institute to men possessing the best qualifications for entering the refrigeration and air-conditioning fields.

At meetings held in several cities throughout the country, selections have been made by industry executives, who take into consideration the candidate's educational background, mechanical inclination, sincerity of purpose, and past accomplishments in the mechanical field.

Bernard Fletcher of Gary, Ind., was selected as winner of the September scholarship awarded at a dinner given in the Bismarck hotel here. Second and third awards, consisting of partial scholarships, went to Bruno Kunke, Jr. of Chicago, and Paul A. Swartz of Melrose Park, Ill.

Attending the Chicago meeting were C. G. Rood, vice president, R. Cooper Jr. and Air Conditioning Corp.; A. N. Gregg, associate editor, National Association of Power Engineers; P. D. Horgan, air-conditioning editor, Chicago Evening American; J. E. Artz, service manager, Montgomery Ward & Co.; J. W. Bostwick, general sales manager, air-conditioning division, Fairbanks-Morse Co.; C. H. Turner, assistant to Mr. Bostwick; L. C. Kohlman, president of L. C. Kohlman, Inc., and L. A. Ororizzi and G. H. Fruechtenicht, service engineers for L. C. Kohlman, Inc.

Representing the U. E. I. organization were E. P. Sorensen, president; A. E. Wake, industrial relations manager; C. R. Markham, director of publicity, and W. B. Fitzgerald, district manager, Chicago area.

According to Mr. Sorensen, meetings with executives of the refrigeration and air-conditioning industries are held regularly and scholarship

awards are given in various sections of the country.

The October scholarship award was given to Hollis R. Sheets, of Huntington, W. Va. by a committee of judges meeting Oct. 10 at the Fort Shelby hotel, Detroit.

Second and third prizes in the scholarship contest, which was open to all students enrolled this fall in the midwestern district, were awarded to Hubert E. Morris of Williamstown, W. Va., and Paul Schoenhaus of Ann Arbor, Mich.

Judges in the contest were C. R. Anderson, manager of the Detroit branch, General Refrigeration Sales Co.; J. G. Andrews, service manager, Mechanical Heat & Cold, Inc.; K. E. Whitlock, Refrigerated Air Conditioning; J. H. Haring, service manager, General Refrigeration Sales Co.; and Henry Knowlton, Jr. of AIR CONDITIONING & REFRIGERATION NEWS.

The meeting was under the direction of A. W. Seydell, divisional manager for U.E.I. Arthur E. Wake of Chicago spoke briefly, outlining the policies of the school in selecting men for training in refrigeration and air conditioning.

Shallcross Develops Flexible Coupling

PHILADELPHIA—A new flexible coupling said to allow lateral displacement of shafts up to .0625 and angular displacement of at least 10° without effect on coupling or bearings has been put on the market by Shallcross Co., manufacturer of mechanical specialties.

Developed by Fred Wood, the company's production manager, and bearing his name, the new coupling is available with hardened steel, canvas Bakelite, or rubber replaceable jaws and with reversible center sections containing driving members of fiber or hardened steel.

Relief Valve Assembly Built By Mueller

PORT HURON, Mich.—A dual relief valve assembly providing a low cost method of installing two relief valves in parallel, thus insuring against loss of refrigerant by making it possible to shut off either valve (but not both simultaneously) to permit servicing or removal, has been announced by Mueller Brass Co.

The assembly consists of two relief valves installed in a by-pass valve. If the by-pass valve is left in a neutral position, both of the relief valves will be in operation. By back seating or front seating the by-pass valve, either one of the relief valves may be made inoperative.

So, if one of the relief valves should become defective or fail to reset properly after being opened, the second relief valve may be thrown into the system by proper adjustment of the by-pass valve, and the defective valve may be removed for repair or replacement without loss of refrigerant.

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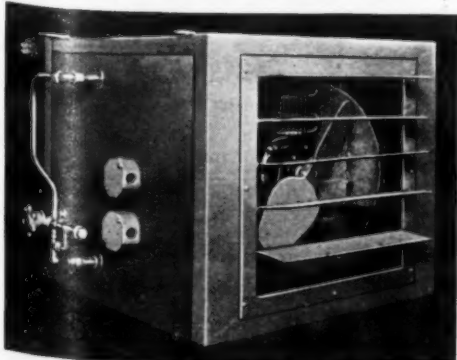


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Installation Methods

Questions and Answers on Advantages Of an Oil Separator & Proper Methods Of Installing It In Refrigerating System

Editor's Note: While oil separators for low-pressure refrigerating systems have been much more widely used in the past two years than previously, there are still many engineers, dealers, and service men who do not fully understand what the functions of an oil separator are, the advantages of using them in refrigeration systems, and how they should be installed.

In the following article Frank B. Riley, president of the Riley Engineering Co., tells just about everything that an engineer or service man should know about oil separators in an article which takes the form of questions-and-answers.

By F. B. Riley, President, Riley Engineering Corp.

IN contacts with engineering and field organizations during the past several years many questions have been asked as to the why's and wherefore's of oil separator design, installation, operation and, in general, to state clearly just why a commercial installation, regardless of size, will benefit through the use of an efficient oil separator.

In many memorandums of these

conversations, a number of the most pertinent questions have been jotted down and the answers tabulated, without any special effort to divide these questions and answers into sections pertaining to any one point under discussion during these many contacts.

These discussions are presented in question and answer form:

Question—How does an oil separa-

tor improve expansion valve operation?

Answer—The screens in expansion valves are comparatively small in area and, while they separate out small amounts of dirt, or corrosive matter, they cannot cope with the large quantity found in some systems and frequently become clogged, preventing satisfactory operation or causing complete stoppage of the valve.

Question—How does an oil separator prevent these troubles?

Answer—The oil separator not only has many times the effective screening area of the valve, but any dirt, scale, core sand, or other harmful matter is immediately caught in the separator and it positively can not pass through the separator outlet. This assures longer and trouble-free life to the expansion valve.

Main Reason Why A Separator Is of Value

Question—Just how does an oil separator improve the operation of a refrigerating installation?

Answer—A mixture of oil and refrigerant raises the boiling point of the refrigerant very materially and this means longer operating time, or excessive capacity in evaporators, or both.

Question—What effect does oil have on evaporators?

Answer—Oil is an effective insulator and a film of oil on evaporator walls cuts down the heat transfer very markedly.

Question—Why isn't it just as satisfactory to catch the oil at the compressor suction port as to fuss with an oil trap?

Answer—Experience indicates very clearly the losses due to oil-insulated evaporators. Every one should understand this, yet some ignore these losses with the hope that their particular compressors do not pass oil, yet make elaborate precautions to separate the oil out at the intake manifold. These measures usually cost more than an efficient automatic oil separator which would keep oil entirely out of the evaporator with the inefficiencies which its presence sets up.

Question—Why, then, do some continue trying to recover the oil at the compressor intake port after permitting it to pass into the evaporator?

Answer—That is a puzzler which is hard to understand. It is so easy to prevent oil from passing to the evaporators that it should never be permitted to do its most harmful work and then try to catch the culprit after the crime.

Question—Does a mixture of oil and refrigerant affect valve operation; that is, are the valves more erratic under such conditions?

Answer—Definitely so. Oil passing along with the liquid refrigerant necessarily occupies some of the valve orifice and, depending on this fluctuating mixture of oil and refrigerant, the valve becomes more or less erratic in holding its setting. Valves are frequently blamed for erratic operation when the trouble is entirely beyond their control.

Question—Waxes in lubricants are a definite problem. Can an oil separator be of any benefit in such a case?

Answer—Wax is in solution with the lubricating oil and, as an efficient oil separator takes out more than 99.99% of the oil from the nebulous gas entering the separator, the wax is also taken out and can not pass along to be deposited in expansion valves or other metering devices. In the refrigerating cycle, wax, once separated out, does not go back into solution. Wax deposited in any metering device causes as much if not more trouble than ordinary dirt and extremely erratic operation follows, or complete blocking of the valve or other metering device.

Question—Aren't there any lubricating oils free from wax?

Answer—The wax content varies considerably with different types of oils used in refrigeration. A high-priced oil is no guarantee that it is free from wax. Select oils that the producer will guarantee to be wax free and then use an oil separator and be on the safe side.

Operation Differs By Various Refrigerants

Question—Is there any difference in performance with the various refrigerants, as to oil separation?

Answer—Oil and methyl chloride and oil and Freon mix readily in all proportions and, with these refrigerants, oil is always a problem leading toward decreasing efficiency. Therefore, every measure should be taken to prevent the oil from passing into the evaporator.

Question—Will the same separator work equally well with the various refrigerants?

Answer—No. Sulphur dioxide and Freon require a larger volumetric capacity in the separator shell than one used with methyl chloride. It is a mistake to use the same separator for all refrigerants, regardless of the tonnage of the unit.

Question—Is it true that in low-temperature work an oil separator will permit from 4 to 7° lower temperature without increase of operating time?

Answer—This has been proved time and again. Oil free refrigerants evaporate at their true boiling point and this, coupled with an oil-free evaporator, proves the answer to the question.

Question—What effect, if any, does an oil separator have on the operation of the compressor?

Answer—Aside from the fact that the oil level is kept constant in the crankcase at all times, assurance is positive that the valves, pistons, and other moving parts will at all times have sufficient lubrication, meaning long life and care free service to the main operating part of the system. No scored pistons, cylinders, cranks, or wrist pins.

Question—Is it profitable to put a separator on all commercial installations regardless of the service; that is, whether flooded types or dry gas?

Answer—Yes, size is not a measure of necessity. The smaller the unit

the less efficient it is and oil will insulate a small commercial evaporator as readily as a larger one. It pays to use an efficient oil separator on all commercial installations, from 1/2 hp. to the largest made.

Question—Why is a separator so important in flooded-type installations, especially with methyl chloride or Freon?

Answer—Everyone knows that these refrigerants and oil mix freely and in flooded systems, due to the wide variation in boiling points of the refrigerants and oil, the refrigerants evaporate and the oil lags behind, causing oil logging so common in this type of installations, with its attendant loss of efficiency.

Question—Does gas velocity have any effect in the return of oil from evaporators?

Answer—High velocities naturally tend to deposit less oil on evaporator surfaces than with slow movement. However, an oily surface tends to keep on gathering the oil film. It is best to keep the oil entirely in the crankcase where it does the most good.

Question—Doesn't the pounding of the needle on the seat soon wear it so that the valve becomes leaky?

Answer—There can be no pounding of needle on the seat. The needle and seat are both submerged in oil to a depth of 1/2 inch. The float ball is very light but of sufficient strength to stand hundreds of pounds of pressure without rupture. With oil on both sides of the needle and seat, there is a cushioning effect which prevents any pounding of needle on seat and, at the same time, the oil makes an ideal means for assuring a positively tight seat at all times and under all conditions.

Question—Isn't there danger of plugging up the needle valve with the shredded metal which is in the separating devices?

Answer—A properly designed separator does not use shredded metal and there should be nothing to come loose and lodge in the seat orifice.

Question—With the float and needle near the bottom of the shell, isn't it possible, or probable, that the needle orifice may become clogged with foreign matter and cease to function?

Answer—With the seat of the separator 1 1/4 inches above the bottom of the shell, there's ample room below for sediment, or dirt to collect. This is in addition to the fact that triple screens on the inlet will catch practically all coarse foreign matter such as core sand, metal chips, or filings, hard or soft carbon, dehydrants, etc., thus trapping out any foreign matter which might float in the oil and cause trouble.

Question—Isn't the needle apt to leak as in other devices with needle valves?

Answer—There is no guide to become clogged in good oil separator construction; the needle point, only, rests in the seat orifice. No chance for a sticky, or gummed up guide.

Question—Doesn't fine sediment which may find its way into the separator from the compressor get into the needle valve?

Answer—The needle and seat orifice are at least 1 1/4 inches above the shell bottom and any sediment would, entering the shell, collect far below the needle seat.

Purpose of Using Adapter Blocks

Question—What is the purpose of adapter blocks?

Answer—Where a compressor high side has been charged with refrigerant, it is advisable to use an adapter block to prevent loss of the refrigerant while installing the oil separator. The separator then could be removed at any time, if necessary, without loss of refrigerant charge.

Question—On a factory installed job, is an adapter block necessary?

Answer—No. A small shutoff valve just ahead of the condenser is all that is necessary. This will permit removal of the separator without loss of refrigerant.

Question—Why suggest a blow-off valve on the larger separators of 10 to 50 tons capacity?

Answer—For the reason that the larger jobs are usually installed in the field where it is difficult to keep dirt and moisture out of the pipes, or tubing. This may cause an accumulation of foreign matter in the shell that would automatically be blown back into the crankcase. The blow-off valve will permit this accumulation to be blown out from the bottom of the shell, say after the

(Concluded on Page 31, Column 1)



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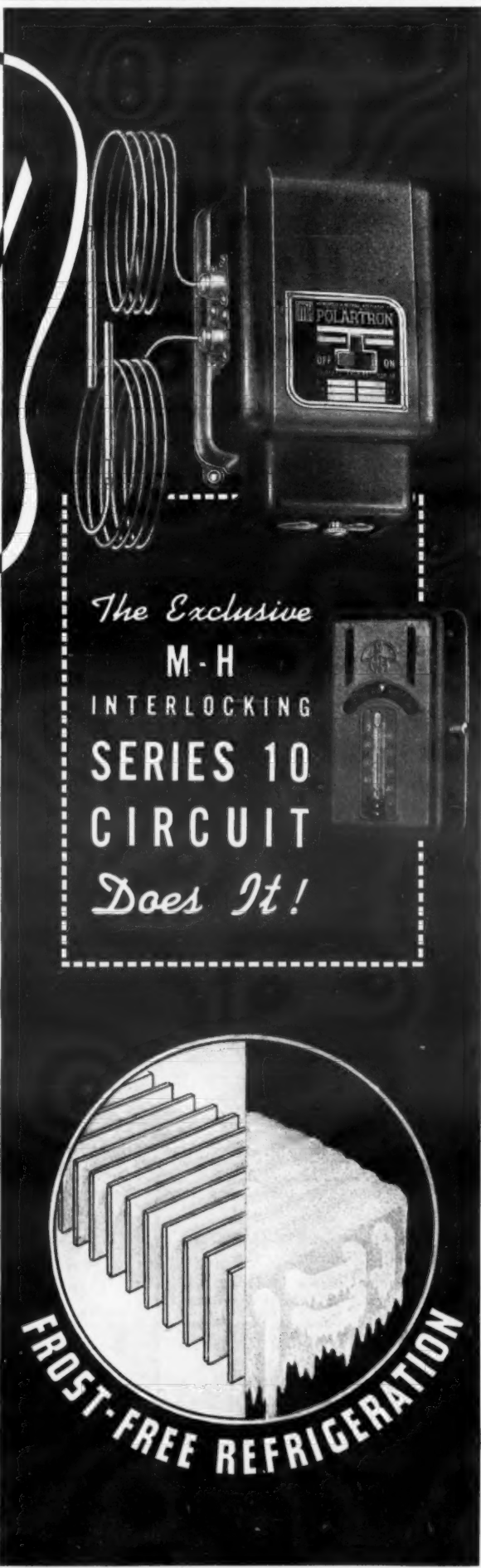
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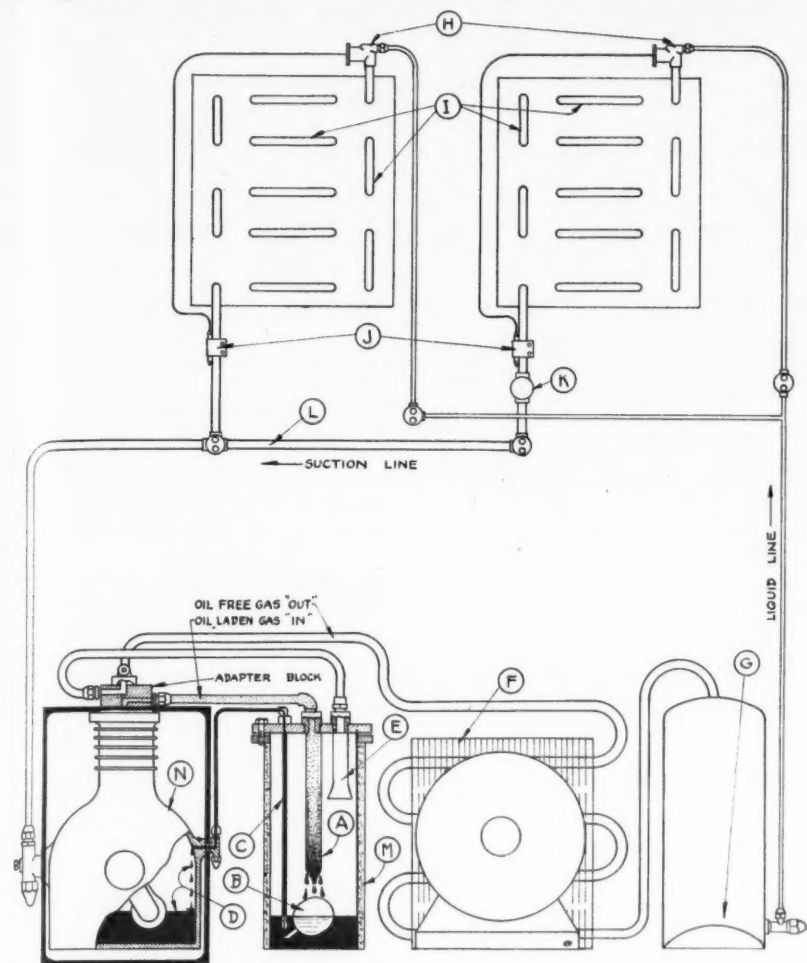
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Graphic Illustration of Oil Separator's Functions



Drawing showing how an oil separator works, where it should be located in a refrigerating system, and what it does to help the system operate better. (A) Oil collector shell; (B) automatic oil return mechanism; (C) Oil return to crankcase; (D) Oil returned from separator; (E) Auxiliary oil and sediment baffle; (F) If oil gets in here (condenser) it causes slow heat dissipation; (G) Without an oil separator, oil collects here; (H) Oil at this point causes erratic valve operation due to deposit of gummy oil, corrosion, or separations of waxes, and frequently causes complete stoppage of valve

screens. (I) Oil collects on evaporator surfaces and acts as an insulation, causing slow heat transfer and increased running time. Oil and refrigerant in evaporator increases the boiling point of the refrigerant. (J) Oil slugs passing thermostatic valve control bulb causes erratic valve action (flooding and starting); (K) Cold, gummy oils cause erratic action of two-temperature or constant temperature valves; (L) Cold oil collecting in the tubing of return lines causes pressure drop; (M) Separator insulation prevents condensation of refrigerant in separator shell; (N) Lubricants serve their only useful purpose in the compressor.

in low-temperature installations; that is, does the oil separate out more readily on evaporator walls in this class of work?

Answer—It would be foolish to deny that oil in a nebulous state not only clings readily to an oily surface but congeals more readily on a cold surface. This condition very materially cuts down the heat flow causing a serious loss of efficiency in low-temperature work.

Question—If a heat exchanger is used, is it necessary to use an oil separator also?

Answer—The heat exchanger has no relation to oil separation. Keep oil completely out of the condenser, liquid receiver, and evaporators and forget about oil troubles and various other ills that beset the average refrigerating system.

Question—Why are there so many different sizes indicated for the various compressors according to horsepower or tonnage?

Answer—Long experience has clearly shown that a separator of a definite size is efficient in separating out all of the oil only when used with a compressor capacity which experience has shown that it will do just what it is intended to do. A smaller size will not separate out all of the oil.

Question—Is it possible for a separator to be too large for the installation?

Answer—The danger in this instance is not merely excessive cost, but, unless very heavily shielded against cold or drafts, some refrigerant may condense in the shell and be returned to the compressor crankcase and in this way cause considerable loss of efficiency to the installation.

Location of Separator For Best Results

Question—Where, for best results, should the separator be located in relation to the compressor?

Answer—Place the separator as near the compressor as possible, in order to keep up the heat of compression and prevent condensation in the separator shell.

Question—Is it a good plan to place the separator between the compressor and the motor where it might be in the air stream of the fan?

Answer—Yes, the insulation, or shielding, on the separator shell will prevent any chilling of the shell and the heat of compression will not be dissipated causing condensation.

Question—If it is necessary to locate the separator at some distance from the compressor, are any special precautions necessary?

Answer—The discharge line from

compressor to separator should be well insulated and the separator well shielded or insulated to keep up the heat of compression. This will prevent condensation of the refrigerant in the trap.

Question—Are the steel shells used in oil separators sufficiently strong to withstand excessive pressures?

Answer—Steel shells of proper design, in fact the entire separator assembly, should be designed to withstand more than five times the normal working pressures of the high side.

Question—If oil separators are so useful, why haven't they been used by all unit manufacturers?

Answer—Practically all ammonia unit manufacturers have used a crude sort of oil separator since the beginning of the industry. The unit manufacturers of the modern low-pressure refrigerants practically all started with domestic units where efficiency was not in question. Later they began to occupy the commercial field, the engineers knowing practically nothing about oil separators or their use, have spent literally hundreds of thousands of dollars in trying to recover the oil on its return from the evaporator to the compressor. It is comparable to locking the door after the horse has been stolen.

Suggestions Outlined For Obtaining Best Possible Results With Oil Separators

(Concluded from Page 30, Column 5) first month's operation and, with the addition of clean oil, the unit will continue to give satisfactory operation indefinitely.

Question—If the blow-off is advisable in the larger units, why not in the smaller ones?

Answer—Because it is much easier to keep the small installations clean. Many of them are package units made up at the factory under the best of conditions. Also, the separator can be easily removed and cleaned out, if in the opinion of the operator it should be necessary or desirable.

Question—Isn't it true that an oil separator will sometimes act as a condenser and liquify some of the refrigerant, as well as the oil, and thus cut down efficiency of the complete assembly?

Answer—Yes, an improperly designed separator might act as a partial condenser depending to some extent on ambient temperatures. However, a method of shielding, or insulating the separator shell has eliminated this hazard completely.

Oil Separators Adaptable To All Types of Evaporators

Question—Isn't the flooded-type evaporator the only one in which an oil separator will prove beneficial?

Answer—No, decidedly not. Flooded evaporators, multiple installations, direct-expansion evaporators all are subject to oil insulation and are greatly improved in operating characteristics through use of an oil separator.

Question—In dry gas expansion, what type of evaporator causes the least accumulation of oil?

Answer—An evaporator of tube construction with gas inlet at the top and a continuous downward pitch to the coil and without traps so that the oil will flow back by gravity to the compressor.

Question—What is the danger in multiple commercial evaporator installations of oil gathering?

Answer—It is seldom that all evaporators will have the same gas velocity and the evaporators with

slower velocity will tend to gather more oil and especially so if there are any traps in which the oil may gather.

Question—Can oil separators be used in refrigerated truck service?

Answer—Oil separators have been used by truck operators for the past several years and with marked success.

Question—Granting that truck service is possible, how about their use in railroad transportation?

Answer—There is no difference in so far as successful operation is concerned.

Question—Will an oil separator prevent oil logging in evaporators, or will a separator clean up an oil logged condition in multiple systems?

Answer—Yes. There can be no oil logging where an efficient separator is used, and an oil logged condition will be cleared up as fast as oil returns to the compressor. However, the oil level in the compressor must be watched, for any oil returning and again passing the pistons will be caught in the separator and returned to the crankcase, hence an overloaded oil condition may occur unless oil is bled off from the crankcase as it accumulates.

Question—With the old style low side evaporators, especially the flooded type using SO₂, it has been necessary to carefully calibrate the float to preserve a definite blanket of oil above the refrigerant.

Answer—With an oil separator there would be no oil in the flooded-type evaporators and no necessity for float calibration, nor any necessity for devising ways to coax the oil back to the crankcase.

Question—Is it a common practice to add more evaporator surface than the job calls for because of the insulating effect of oil in the tubing walls?

Answer—We are told by engineers of some of the largest manufacturers of compressor units that they always add upwards of a third more evaporator surface than the job actually calls for just to compensate for this insulating effect of oil.

Question—Is oil more troublesome



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Locker Storages

Locker Owner Stresses Savings, Health & Convenience of Lockers In Selling Plan To Farmers

BOULDER, Colo.—A four-point selling program based on the factors of health, economy, convenience, and dependability has been instrumental in the successful operation of a cold storage locker plant during the last two years by Lewis Marshall, of Marshall Feed & Locker Plant here.

Mr. Marshall has realized considerable profit on his initial investment of \$6,000 in the locker plant, but the thoroughness with which he planned the venture insured this.

After investigating the possibilities of cold storage lockers, Mr. Marshall drafted his four-point plan. He then talked with the farmers who bought grain from him, and explained his plan to them.

SOLD LOCKERS FIRST

Selling the farmers on the idea of the locker plant, Mr. Marshall signed them up to lease lockers, and gave them locker numbers.

Then he built the locker plant. In presenting his four-point plan

to the farmers, Mr. Marshall arranged it in outline form, as follows:

A. Lockers will save money in three ways:

1. Butchering can be done when live stock prices are low.
2. Expenses of pickling and canning are eliminated.
3. High retail prices are avoided by placing fruits and vegetables taken direct from the garden in the locker.

HEALTHFUL VALUE

B. It is healthful to use cold storage lockers.

1. Food poisoning which sometimes affects home-canned products does not develop in frozen foods.
2. Frozen foods have a higher vitamin content than do foods that are canned.
3. Proper freezing and storage kills 80% of harmful bacteria found in meats.

C. Lockers are convenient in four ways:

1. Butchering can be done in any season, thus eliminating work in cold weather.
2. The trouble of curing and canning meats is overcome.
3. Out of season fruits and vegetables can be enjoyed the year around.
4. The locker, located near town, is just as close as the shopping center and is open at regular hours, including Sundays.

D. For dependability, all products can be kept indefinitely and used when desired.

There are three principal divisions in the Marshall locker plant—meat-cutting and display room, chill room, and locker room.

Using all space to advantage, Mr. Marshall derives profit from retailing meat cuts, lard, and hamburger; from the sale of groceries while the customers wait for special cuts to be trimmed and labeled; from renting lockers; from meat-cutting charges; and from the sale of hides, liver, and other parts taken in payment for butchering.

DISPLAY CASE

In the meat-cutting and display room, Mr. Marshall installed a refrigerated display case, and lined the walls with shelves to hold canned goods. There also is a cutting block and a hamburger grinder.

A custom butcher is employed to cut customers' meats into roasts, steaks, chops, and other forms. Payment for this service is made in cash, or in meat and trimmings.

Meat taken in payment is kept in the display case and sold at retail

prices. Scraps from trimming are made into hamburger, and fat waste is processed into lard.

The beef room, or chill room, is kept at a temperature of 36° F. Here all freshly butchered meat is chilled and aged properly before being cut. The beef room also is used for pickling work, and barrels are placed in the corners.

Locker room is equipped with 500 lockers, each numbered and fitted with its own lock. The lockers are made of wood and vary in size, some holding up to 75 lbs., others holding more than 100 lbs.

After cutting, meat is wrapped, tagged, and given to the customer, who takes it to his locker and puts it in himself. In this way, Mr. Marshall cannot be held responsible for misplacement, and the locker renter knows exactly what is in his locker.

Annual rental of the lockers ranges from \$7.50 up, depending upon the size.

Walls, floor, and ceiling of the locker room are lined with 6-inch cork strips.

SOLD FEED CUSTOMERS

In recounting his experiences with the locker plant, Mr. Marshall said, "I built all my hopes of operating a profitable locker system around the number of customers who bought their grain from me.

"Practically all who traded with me were farmers, and farmers need somewhere to hang their meat after butchering. I talked with them and soon put across the idea that by using cold storage lockers their meat would keep safely in any quantity, and could be consumed over a long period of time.

"When lockers are emptied, a sales talk centering around my four-point plan, or an advertisement in the local paper, soon has them full again.

"As a result of running a combined feed and locker plant, farmers in this area can have meats during the hottest months and have them fresh, without pickling or canning. Christmas dinners are made more tempting with fresh raspberries and cranberries and whatever the customers placed in their lockers months before.

"Two years ago, it was an ideal investment to open a locker plant in Boulder because it is a rich farming community, and at that time there were no cold storage lockers available for rent in a radius of 150 miles."

YORK EQUIPMENT USED

To get his refrigeration system, Mr. Marshall contacted the York Refrigeration & Air Conditioning Co. of Denver. This company offered an

installation at a price of \$2,500, the job being simple in design and effective and economical in operation.

The following week, installation work was in progress on a freezing unit which would maintain, with one compressor and a system of hand valves, temperatures of 8° F. in the locker room and 36° F. in the chill room.

One 4x4 compressor operated by a 10-hp. motor is used, according to J. O. Turner of the York company. Compressor feeds ammonia through pipes to the chill room, Mr. Turner said. In the chill room, a three shut-off valve bypass can be operated to keep the room at any desired temperature.

From the chill room, the ammonia pipes run to a 10-inch by 12-foot surge drum in the locker room, located between the coils. A 3-inch ammonia level is retained at the bottom of the drum when all pipes in the room are filled.

Hand valves on the drum can be manipulated to sustain the desired temperature. From the bottom of the drum, the ammonia flows to eight hairpin coils which are 28 feet long and four pipes wide, installed above the aisles to prevent dripping on the meat.

In the process of expansion, the ammonia flows as a gas through the coils to the top of the surge drum, and from there to the compressor to complete the cycle.

A series of hand valves connected to the coils in both the chill and locker rooms can be operated to control a steady desired temperature in both rooms simultaneously.

Chill room contains four hairpin coils, eight pipes wide and 15 feet long. Defrosting is done by scraping the coils.

Many Tourists Visit Locker Plant at Forest City, Ia.

FOREST CITY, Iowa—Visitors from many states, including California, Illinois, Florida, Nebraska, and Minnesota, to say nothing of hundreds from various sections of Iowa, have registered at the Walker Locker Cold Storage System plant.

Plant Averages 3 Carcasses Daily Since Opening

LUVERNE, Iowa—Owners of the locker storage plant recently installed by the Hefti people here report that they have been cutting up an average of more than three carcasses a day since the plant's opening.

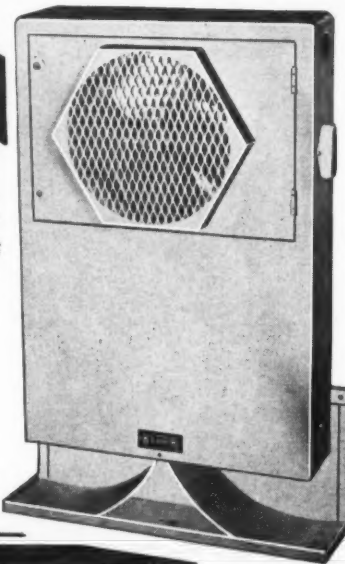
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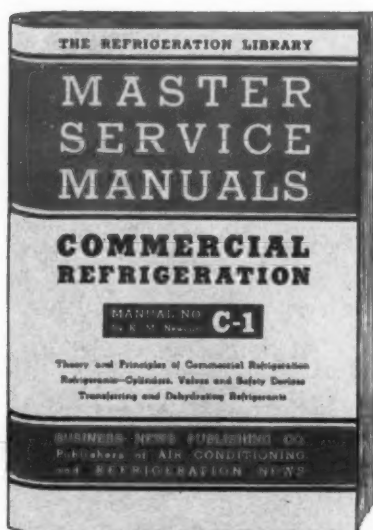
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KRAMER TRENTON AUTO RADIATOR WORKS TRENTON, N. J.

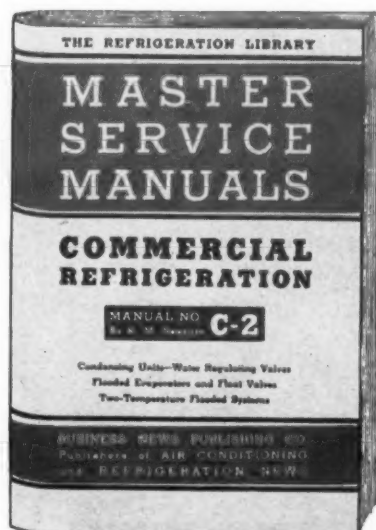


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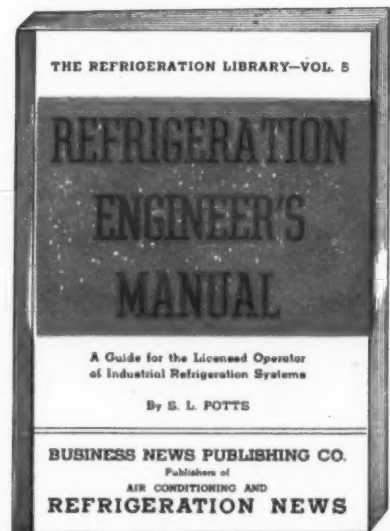


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Manual E-1

This 224-page manual was written as a guide for the licensed operator of industrial refrigeration systems. It covers the selection, installation, and maintenance of all types of systems and explains how to figure the sizes and capacities of the various units used in each system. Many diagrams and pictures are used to assist the reader in grasping the fundamental theory of refrigeration.

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Commercial Refrigeration

'Banana Hygrometer,' Dual Switches, Pilot Lights, New Controls Feature Produce Job

By Henry Knowlton, Jr.

DETROIT—Commercial refrigeration equipment has become a real profit maker for Leo Cianciolo & Son, produce brokerage house on the Eastern Market here.

For many years Leo Cianciolo has been faced with the problem of taking severe losses on surplus merchandise. Produce left over from day to day, and particularly on week-ends, resulted in the common practice of "dumping" on the market before spoilage set in.

"A crate of lettuce, for example, should sell for \$4, but late in the afternoon or on Saturday, we were often lucky to get \$3," Leo Cianciolo says.

FRUIT DISPATCH HELPED

Construction of a produce room and four banana storage rooms, all built in accordance with specifications established by the Fruit Dispatch Co. of New York, operating sales agency for the United Fruit Co., has made a tremendous change in the profit side of the produce business, Mr. Cianciolo asserts.

The installation is marked by such appurtenances as a "banana room hygrometer," a dual switch control arrangement for the blower and refrigeration units, and lights which tell the operator just how the system is operating.

Refrigeration equipment in the five rooms was installed by General Refrigeration Sales Co. The installation was under the supervision of C. R. Anderson, branch manager.

Leo Cianciolo can hardly be considered a novice in the produce business. Born in Termini, near Palermo, Sicily, he came to Detroit in 1892, and in 1902, at the age of 16, began selling lemons out of a basket to bars and restaurants up and down Woodward Ave.

KNOWS THE BUSINESS

Two years later Leo graduated to a push cart, and in three more years became the proud owner of a horse and wagon. In 1912 Leo bought his first truck, from which he marketed a line of fruit and produce.

After 10 more years of selling "direct to you," Leo decided to enter the wholesale produce game, and in 1922 he established a place of business at 2422 Market St. Leo Cianciolo still does business here, and the years have brought few changes, except in the size of his organization, and the recent addition of mechanical refrigeration.

Today Leo is assisted in the business by his three sons, Fred, Vincent, and Joe, and by his nephew, Fred Rini, who is a partner in the business. Joe and Jerome Rini are also employed by the company, which has 15 employees at the present time.

Size of the Cianciolo establishment, which measures approximately 20 by 100 ft., is no criterion of the business handled by the firm. More than one thousand packages (crates to the uninitiated) of produce are handled daily, including 50 large bunches of bananas.

Four banana ripening and storage rooms have been constructed in the

basement of the building. These rooms measure 12 x 14 x 8 ft. and are insulated with 3-inch corkboard having a smooth plaster finish. They are equipped with conventional walk-in cooler doors.

Refrigeration for each of the four rooms is furnished by a Peerless spine-fin blower-coil unit having fins formed by single wires, similar to those found in a heavy wire brush. The cooling units are powered by a Lipman 5-hp. Freon compressor.

CONDITIONS FOR BANANAS

According to Mr. Cianciolo, temperature in the banana ripening rooms should not go below 56° F. and not above 70° F. Fruit stored above or below these temperatures is subject to damage.

From long experience Mr. Cianciolo has found that no two cars of bananas are exactly alike.

"When a consignment of bananas comes in we look them over, feel them, and check their condition. From this examination we can tell about how long it will take for the fruit to ripen," Mr. Cianciolo said.

From this remark it would appear that handling bananas could be considered an art, and that like handling cheese, fine wines, and brewing processes, good results can only be obtained after long experience.

When bananas are placed in the storage rooms to ripen they are first brought to a temperature of 75° F. and about 90% humidity for a period of 12 hours. The fruit is then allowed to remain in the closed rooms for three days.

HOW HEAT IS SUPPLIED

Heat for each of the banana storage rooms is supplied by a Niagara gas heater, distributed by John H. Murcott of St. Albans, N. Y. The heaters are equipped with all modern gas safety controls, the control mechanisms being located outside the storage rooms to prevent any possibility of an explosion. Each of the heaters is equipped with a special humidifier; the water supply is regulated by a float valve system.

Atmospheric conditions in the banana storage rooms are gauged by a special "Direct Reading Banana Room Hygrometer," also supplied by the Murcott Co. This unit is equipped with four scales, showing both wet and dry-bulb readings for ripe and green fruit.

HOW HYGROMETER WORKS

For either type of fruit the scales are calibrated in a manner which results in the mercury levels being equal in both thermometers when atmospheric conditions are correct. The operator of the plant is thus able to determine if conditions in the room are correct by a single glance at the instrument.

Control of the refrigeration system is by a dual switch arrangement, supplemented by two thermostats. Switches outside each of the storage rooms may be set for:

1. Continuous fan operation.
2. Continuous fan and intermittent heating.
3. Continuous fan and intermittent cooling.
4. Intermittent fan and intermittent cooling, synchronized.

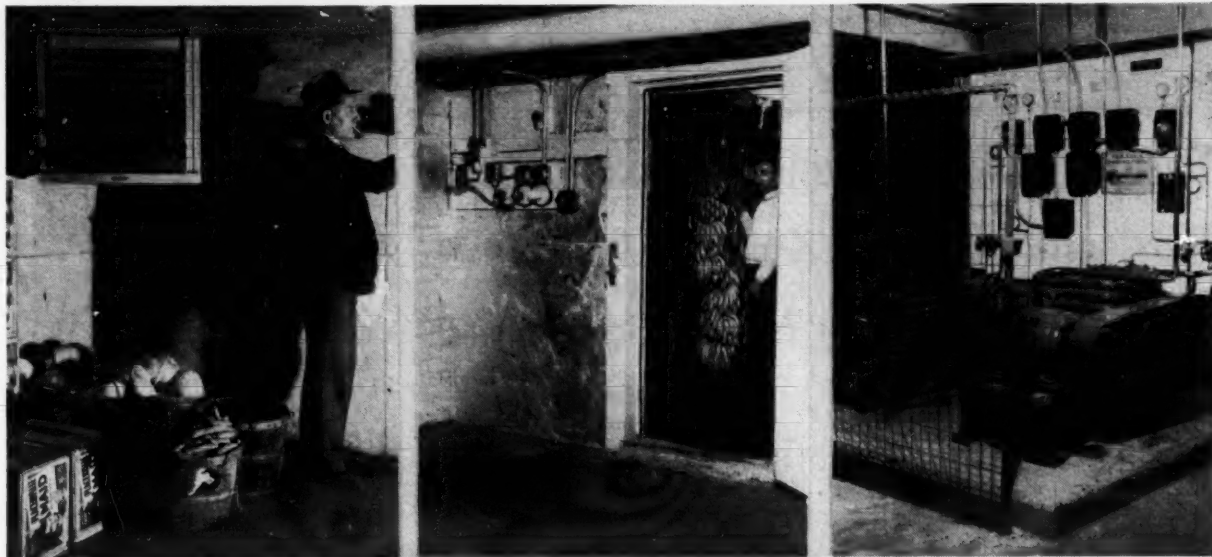
When the correct temperature has been reached, the heating and cooling systems are operated by thermostats. Control of the refrigerant is by means of a solenoid valve located in the liquid line, actuated by a thermostat. A constant liquid pressure is maintained against this valve at all times by a pressure control on the compressor.

Control panels outside each of the banana storage rooms are equipped with a battery of signal lights. A small red light is used as a pilot to indicate that lights inside the storage room are in use.

LIGHTS TELL STORY

An orange light burns when the heating system is running, a blue

A Smart, Neat Installation For Produce Rooms



(Left): Fred Rini adjusts the control in the Cianciolo produce storage room. Peerless spine-fin coil at upper left. (Center): Two of Leo Cianciolo's "boys" examine the condition of bananas in one of four storage rooms. Note outside thermostat, dual switches, and colored lights on panel at left of door. (Right): Lipman 5 and 3-hp. Freon compressors. Note workmanlike installation and wire guard.

light when the compressor is operating, and a green light turns on when the fan on the suspended coil is in use. In this way the owner can tell the exact operating status of his equipment without opening the doors.

Another room of equal importance to the Cianciolo company is the "produce storage room," measuring approximately 20 x 20 ft. This room is insulated with 4-inch corkboard, finished in smooth plaster. Refrigeration is supplied by a 2-hp. Lipman Freon compressor and a suspended blower coil unit. Temperature in the

produce room is kept at 40° F. The room is used to store apples, peas, lettuce, brussels sprouts, pears, oranges, cabbages, and other commodities handled by the company.

'POLARTRON' CONTROL

Prime purpose of the produce room is to prevent "dumping" on the market at the end of the day, or on Saturday afternoon, when a hold-over may result in loss of merchandise, and a sale will mean a reduction of 25% or more in price.

Temperature control for the prod-

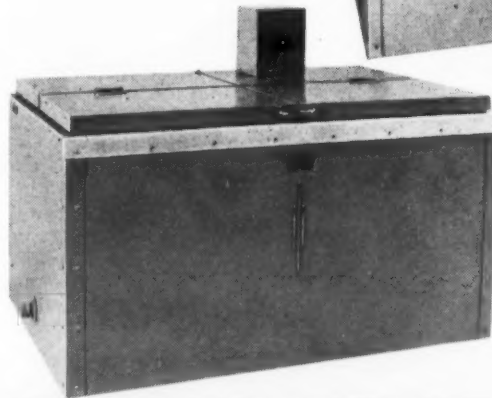
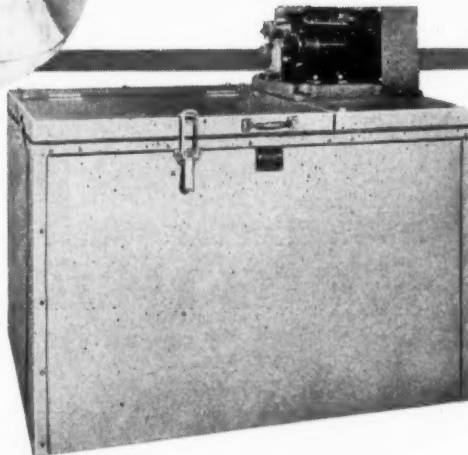
uce room is by means of a Minneapolis-Honeywell "Polartron," which halts the refrigerating effect by means of a thermostat, when the desired temperature is reached, without waiting for the compressor to cut-out on pressure. In this way extremely low temperatures are avoided, preventing excessive dehydration of products in storage.

Leo Cianciolo states that perishable vegetables and fruit "held" in his storage room can be preserved for days and even weeks without visible deterioration.

FOR MILK COOLERS *leading builders choose* ARMSTRONG INSULATION



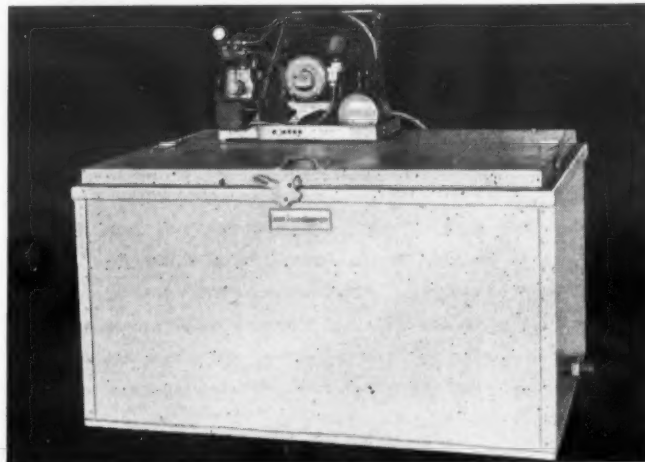
RIGHT:—WILSON MILK COOLER (1930 Model) is insulated bottom and top with Armstrong's Temlok, on the sides with Armstrong-Corning Wool. The long, springy fibres of Armstrong-Corning Wool have a permanent resilience that helps to keep it efficient through years of hard service.



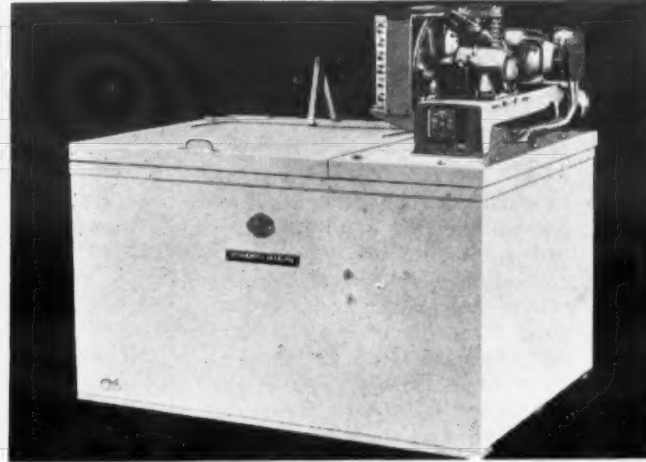
LEFT:—ESCO MILK COOLER, insulated throughout with Armstrong's Temlok. This rigid fibreboard insulation is light in weight, easily handled. It is supplied in various thicknesses, and in fabricated sets if desired. Temlok is low in cost, highly moisture-resistant, and easily handled in assembly.

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Engineering

Plastics Finding Many Applications In Refrigeration & Air Conditioning; Study Shows They Can Be More Widely Used

By Herbert Chase, Engineer and Consultant

ENGINEERS have not been long in discovering the utility of plastics in air conditioning and refrigeration. There are, however, many engineers who would like to become more familiar with plastics and learn how they might be used to advantage more extensively.

A good starting point in such a quest can be found in examination of existing uses and in studies of the properties of the more important plastics available.

LONG USED IN BREAKER STRIP

In refrigerators, the largest single use of plastics is in breaker strips. These are nearly always cut from laminated sheets, although some have been molded. Black, paper-base, phenolic plastics are chosen because they combine high resistance to water, grease, food, beverages, and the like with low cost.

Appearance also is excellent and continues so throughout the life of

the refrigerator. Trouble from warpage is not a factor of importance, thanks to relative imperviousness to water and resistance to moisture absorption.

In general, the laminated breaker strip is stronger than the molded form, though perhaps not necessarily so, as paper or equivalent reinforcement can be incorporated in molding with certain types of material.

The molded form can be shaped at the ends and, of course, does not require machining, since it is molded to shape and size. This type would be applied more extensively, no doubt, were it not for the cost of molds and the large number of sizes required. These factors account in large part for the greater use of laminated stock, even though the latter has to be cut with some waste, and involves considerable machine work on edges and ends and in making holes for fastening, besides requiring separate corner pieces for fastening and finish.

COLOR IN BREAKER STRIPS?

Although breaker strips in white or ivory color could be produced, they would require the use of more expensive materials, such as the urea resins, and would be higher in cost both because of the greater resin cost and the probability that rejects would be much higher than with black phenolic.

The problem does not appear insoluble, if a higher cost than for phenolic stripes ceases to be an obstacle, but it involves experiment and expense which have not been thought worthwhile to date, especially as the only apparent advantage would be the light color.

Matters of appearance are not to be overlooked, however, with so

In Household Cabinets



Fig. 1—Plastics find many uses in this modern household electric refrigerator cabinet. They include Plaskon (urea) drawer fronts, lamp shade, shelf studs, and hinge caps and breaker strips of laminated phenolic material.

much emphasis being placed on visual sales appeal, and it is likely that the last word has not been said on this subject.

Both the phenolic and urea plastics are of the thermosetting type. Once mold or laminated, they are not softened by heating as are the thermoplastic materials.

Heat applied in molding or laminating phenolic and urea plastics first softens and fluxes the material, but a further rise in temperature results in an irreversible chemical change in permanent hardening.

The resulting products are extremely inert chemically, hard, smooth surfaced and strong. Impact strength, especially of molded parts, is well below that for metals but is ample for such parts as are here considered. No applied finish is needed; and parts come from the mold in substantially finished form and size.

PHENOLICS AND UREAS

Although the phenolics and ureas differ greatly in chemical composition, they can be used more or less interchangeably (since many of their properties are nearly the same) except where color and translucency are required. The latter are important in many applications and account for extensive use of the ureas where otherwise the cheaper phenolics would be chosen.

In general, molded and laminated phenolics, being made from resins of amber color, and being mixed, for strength and cheapness, with opaque fillers and pigments, are dark in color or black, and tend to darken with aging.

The ureas, however, are made chiefly in white, ivory, and light tints and do not darken with aging. The filler used is white alpha cellulose and it results, in combination with the white transparent resin, in materials whose beauty is enhanced by reason of their translucency. The latter is also important in lighting applications.

Color is, of course, a controlling factor in many exposed parts, as it affects appearance in a marked degree. In consequence, and especially as light tints or white are demanded for refrigerator and for some air-conditioning uses, there is wide use of ureas in such parts as hardware, trim, drawer fronts, shelf studs and supports, light shields, knobs, and dials.

UREAS IN DIALS

In shades for lamps and in dials, the translucency of the urea affords diffused lighting, besides providing a white or ivory color harmonizing with adjacent parts and usually associated with sanitary kitchen utensils.

Plastics provide smooth and rounded surfaces which are easily kept clean and are not affected by washing. They are entirely free, of course, from the corrosive action which affects metal parts, and are more pleasant to the touch.

Doors for evaporators or ice compartments could be molded from urea plastics and have been considered for such use, but the author does not know of any application at this time. The design of such a door would require careful study and might necessitate some metal reinforcement, but appears to be entirely practical.

DANGER IN MOISTURE

Ureas are not recommended, however, where water may stand in continuous contact with them, as in crisper trays, for example, because such contact may result in cracking. Some special water-resistant grades of phenolic plastics will withstand such contact, however, and crisper trays of such material have been molded and used with success.

For parts which are normally hidden from view or which, though exposed, are satisfactory in black or dark colors, phenolic moldings are excellent and lower in cost than the urea type. This is true of numerous control parts and of housings for such parts, including those in which a dielectric is required.

USE IN CONTROL CASES

Control cases, as an accompanying illustration indicates, can be molded in extremely complex shapes and may have numerous metal inserts to serve as electrical contacts or for mounting other elements of the control. In such housings, the plastic serves as an excellent dielectric,

Different Uses

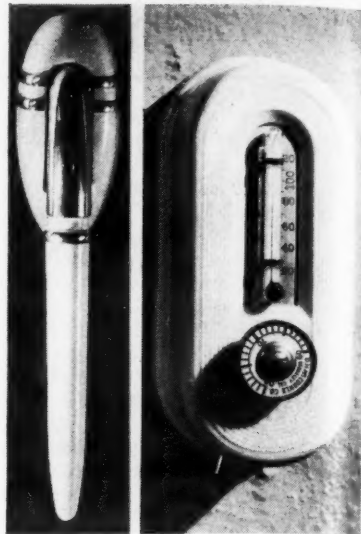


Fig. 2A (left)—Smart appearance and a smooth, sanitary grip, pleasant to the touch, are realized in this exterior handle which involves a combination of Plaskon and metal parts.

Fig. 2B (right)—A thermostat housing which is molded in ivory Plaskon to harmonize with interior walls and trim.

besides performing other functions.

Some control cases, in which complex coring or side openings are needed, are molded in three-way presses, the side ram serving to position the cores, to pull them from the molding, and to shape side faces or recesses.

Although the ureas are excellent dielectrics, they are not in all cases recommended where inserts must be molded in place. Metal inserts can be applied or fastened with hollow rivets or by other means after molding, however, and yield good results if the urea is preferred to the phenolic part for reasons of appearance.

For dials, the ureas furnish a light background into which letters or numerals can be molded and subsequently filled or "wiped" in with a pigmented finish giving the desired contrast. Recesses and holes for mounting are readily provided in the molding of the dial.

TEMPERATURE FACTOR

Besides the phenolics and ureas, which are used not only in refrigerators but also for thermostat housings and for dielectric purposes in air-conditioning equipment, there are, of course, many other types of plastic. Nearly all of the other types, however, are thermoplastics, and are subject to softening if heated above certain critical temperatures. The latter are usually well above those encountered in normal use, but even at normal temperatures most thermoplastics are subject to some cold flow or to creep under stress. This is sometimes a factor in preventing their use, although allowance for it can often be made in design.

The chief factor operating against (Concluded on Page 35, Column 1)



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A good Bellows is the heart of a good Packless Valve.

If you use valves, cut your service costs by insisting on Sylphon-Equipped Valves. For this Seamless, Jointless, Sylphon Metal Bellows banishes packing problems.

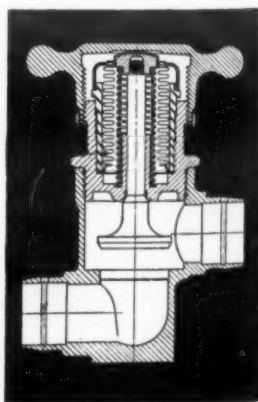
Dependable, long-lived (on test, it has withstood 300 million flexings without noticeable fatigue)—this bellows provides faultless service throughout the life of the valve.

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Plastics Finding Wider Use in Refrigeration Equipment Design

(Concluded from Page 34, Column 5)
wider use of the thermoplastics, however, is their higher cost as compared to phenolics and ureas. Partly for this reason, use in refrigeration and air conditioning is confined largely, if not entirely, to a few small parts, chiefly those which can be injection molded.

MOLDING

In ordinary compression molding of such plastics, the mold has to be heated and cooled alternately, whereas with injection molding it remains cool, shortening the molding cycle and reducing costs.

Some opaque thermoplastics are produced, but for the most part such plastics are translucent or transparent and are used without fillers. Exceedingly beautiful color effects are realized in some instances, and clear water-white moldings are possible, even for instrument cover glasses.

Control Front

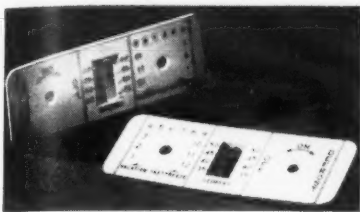


Fig. 3—This white Plaskon dial is attractive, easy to read, and unaffected by moisture. Letters and figures are molded and wiped in with a black pigment containing a binder.

To date, the only thermoplastic which has gained many applications in refrigeration and air conditioning is cellulose acetate, and it has been used chiefly in small parts such as knobs, handles, and bezels.

In one such case, the plastic was molded around a cover glass and, in another, as a shell covering a die-cast zinc alloy handle, the latter used for a crisper drawer. The die casting, in this instance, strengthened the handle, and the plastic acted as a decorative covering.

Many additional facts relating to plastics and their suitability for the type of applications here covered might be given if space permitted. Accompanying photographs, with their descriptive captions, give a good general picture of what has been accomplished and should suggest other uses in which the inherent advantages of plastics may be realized. Not much imagination is required to make it apparent that plastics might well be employed more widely, as, indeed, they are likely to be when engineers become better acquainted with their benefits.

Du Pont Official Explains How Research Brings Jobs & Better Living

PITTSBURGH—Industrial research is now being prosecuted most successfully by those companies in a position to employ a fairly large staff of research workers, and able to spend large sums of money without any immediate return—"patient money," declared Dr. Ernest B. Benger, general assistant chemical director, E. I. du Pont de Nemours & Co., Inc., in addressing the American Trade Association Executives convention here last week.

Until comparatively recent years, scientific research was, for the most part, carried out only by colleges, universities, and similar endowed or state-supported institutions, and such "institutional" research was chiefly fundamental in nature—that is, little or no regard was felt concerning the practical value of the truths uncovered, Dr. Benger declared.

With the rise of our modern industrial system, certain far-seeing individuals, appreciating the benefits that had accrued to mankind from fundamental institutional research, concluded that research might have a place in industry, and thus industrial research was born.

In developing its organic chemicals industry at the close of the World War, said Dr. Benger, the du Pont company spent some \$40,000,000 over a period of five years without a cent of profit. A substantial part of this \$40,000,000 was for research, particularly in the field of dyestuffs.

In recent years research laboratories have so multiplied that today research itself might be regarded as a major industry. Accurate figures on total research personnel are difficult to get, but according to the National Research Council, there are in the United States more than 1,500 industrial and consulting laboratories, employing some 23,000 workers. Forbes magazine says that the industrial laboratories "spend \$300,000,000 a year to develop new things."

"Scientific research," stated the speaker, "has opened up new avenues of employment for countless thousands through the development of new products which gave birth to new industries—the dyestuffs industry, the automobile industry, the rayon industry, the electric refrigerator industry, the radio industry, and the plastics industry for example."

"Fifteen of the major manufacturing industries of today have been developed since 1879, and it has been estimated that these 15 new industries alone have created, directly and indirectly, 15,000,000 new jobs. On the basis of these figures, at least one out of every four persons gainfully employed today owes his job to one of these 15 new industries having their origin wholly or in part in developments resulting from scientific research."

"In the du Pont company, the 12

products or groups of products which accounted for about 40% of the total sales during 1937 have been developed largely during the past 10 years, and the production and sale of these products were giving employment to approximately 18,000 workers at the end of 1937, as compared with about 10,700 employees in 1928 in the same group of products.

"And it is of interest that the average reduction in sales prices for these 12 groups of products from 1928, or the year of introduction if later than 1928, up to and including 1937, has been approximately 40%."

Research Products Buys Filter Division of Burgess Firm

MADISON, Wis.—The Research Products Corp. has recently purchased the building and land at 1011 E. Washington Ave. here from the C. F. Burgess Laboratories, and will manufacture the viscous-coated throw-away type air filter, formerly known as the Burgess filter, under the name Walton.

Officers of the company are Howard F. Weiss, president; Kemper Slidell, vice president; Max H. Kliefoth, treasurer; Milton J. Shoemaker, secretary; and Bertha Weisman, assistant secretary-treasurer.

Mr. Kliefoth, manager of the air filter division, states that the filter line will be expanded.

Compressor Is Installed in Closet for Conditioning St. Joseph Apartment

ST. JOSEPH, Mo.—Among recent installations of air conditioning made by the St. Joseph Railway, Light, Heat & Power Co. here is a single apartment installation in a 21-family building.

Only space available for the equipment was on the top shelf of a closet, where a water-cooled compressor and fan unit were installed. Three feet of ductwork was necessary to carry the conditioned air to a grille located above the closet door.

Complete Air-Conditioning System Installed On New Melbourne-Sydney Train

MELBOURNE, Australia—Running between Melbourne and Albury, on the Melbourne-Sydney division, is the Victorian Railway's new air-conditioned train, "Spirit of Progress."

Recognized as the last word in train construction in the Southern Hemisphere, every car in the "Spirit of Progress" has a solid hull of Corten steel. Every car is completely air conditioned with Trane equipment. Selected insulating materials have reduced noise to a minimum.

Powered by four Pacific-type streamlined locomotives, each named after famous Australian pioneers, the new train runs with a minimum of vibration, even at top speed.

Air-conditioning units used in each car consist of the following equipment: two double-inlet fans having a combined capacity of 2,300 c.f.m., direct driven by means of a ¾-hp. motor; a 14 x 48-inch 8-row Trane direct-expansion cooling coil, and an 8-kw. electric heating element for winter heating.

The compressor is operated by a motor to give four different speeds for capacities of from 5 to 7 tons.

The condenser is a separate unit consisting of a Trane 24 x 72-inch 4-row cooling coil mounted in a frame for individual suspension and

fitted with three 22-inch propeller fans. These fans produce a combined capacity of 9,000 c.f.m.

Control panels are equipped with three thermostats for heating operation. The temperature is selected between 65°, 70°, and 75° F. for cooling, and between 60° and 70° for heating. Because of the fact that none of the Australian railway cars are equipped with steam piping, electric heating is used exclusively.

Air is distributed from the unit through the space between the roof and ceiling of the compartments and corridors. Conditioned air is introduced through openings provided on each side of the compartment ceiling. These openings are balanced so that two streams of air enter at a velocity of approximately 1,000 f.p.m., and meet in the center of the ceiling. This creates an ideal air motion, and eliminates possibility of draft.

Kitchens in the dining car are supplied with 1,500 cu. ft. of outside air, together with 900 c.f.m. of conditioned air. An exhaust fan with a capacity great enough to handle all the air supplied is used in this car.

Air-conditioning equipment for the "Spirit of Progress" was supplied by Crossle & Duff Pty., Ltd., Melbourne, Australian representative of the Trane Co. of Canada, Ltd.

SMOOTH RUNNING

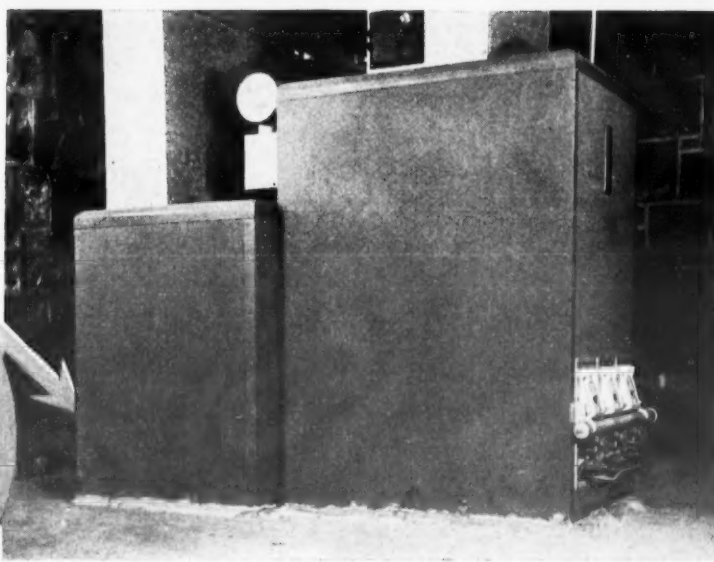
Manhattan V-Belts

Manhattan V-Belts run smoothly... noiselessly... enduringly. Their better performance, longer life result from an exclusive design which welds the endless whipcord—completely floated in rubber—into a strong tension member and places it in the neutral axis area, with an extensible section above, a compression section below. Destructive internal heat is minimized, efficiency kept at the maximum.

THE MANHATTAN RUBBER MANUFACTURING DIV. of Raybestos-Manhattan, Inc.

45 Townsend Street Passaic, N. J.

No Extra Cost — For This Added Protection Against Motor Breakdowns in Damp Basements



Typical Domestic Air Conditioning Installation, Equipped with Century Capacitor Type Motor

New Century Insulation Has Much Higher Resistance to Damage Caused by Moisture

Motors located in damp basements are subject to trouble caused by moisture soaking into the insulation and paving the way for breakdowns... This results in complaints... dissatisfied customers... expensive service calls... lost time.

Now—it is easy to turn these losses into profits... make satisfied customers and friends for your product... at no extra cost.

Before you make any commitments be sure to investigate this new Century Insulation Treatment... It resists deterioration and absorption of moisture... It solidifies the coils into a flexible impervious mass... It seals as it penetrates... Prevents "chafing" between wires... Resists mechanical abrasion... Is thin enough to radiate heat.

Phone, Wire or Write to any of Century's 31 conveniently located branch offices where you will find a qualified representative eager to help you save money.

CENTURY ELECTRIC COMPANY
1806 Pine Street St. Louis, Mo.
Offices and Stock Points in Principal Cities

ONE OF THE LARGEST EXCLUSIVE MOTOR MANUFACTURERS IN THE WORLD



THE OUTSTANDING AIR CONDITIONING SYSTEMS PROFITABLY—

Utilize Genuine
HUSSEY PURE LAKE COPPER

Foresighted manufacturers are building a reputation for extra service into their air conditioning units by using and specifying genuine Hussey Pure Lake Copper for all parts subject to corrosion and high humidities.

Mined from the famous Great Lakes copper fields, Hussey Pure Lake Copper is a natural form of pure copper equipped by nature to withstand the test of time better than any other type of copper. Specify Hussey for the best in copper!

C. G. HUSSEY & COMPANY

(Division of Copper Range Co.)

Rolling Mills and General Offices: Pittsburgh, Pa. Warehouse Stocks in the Principal Cities

Copper **HUSSEY** Brass

Service

Flooded System with Low Side Float Valve

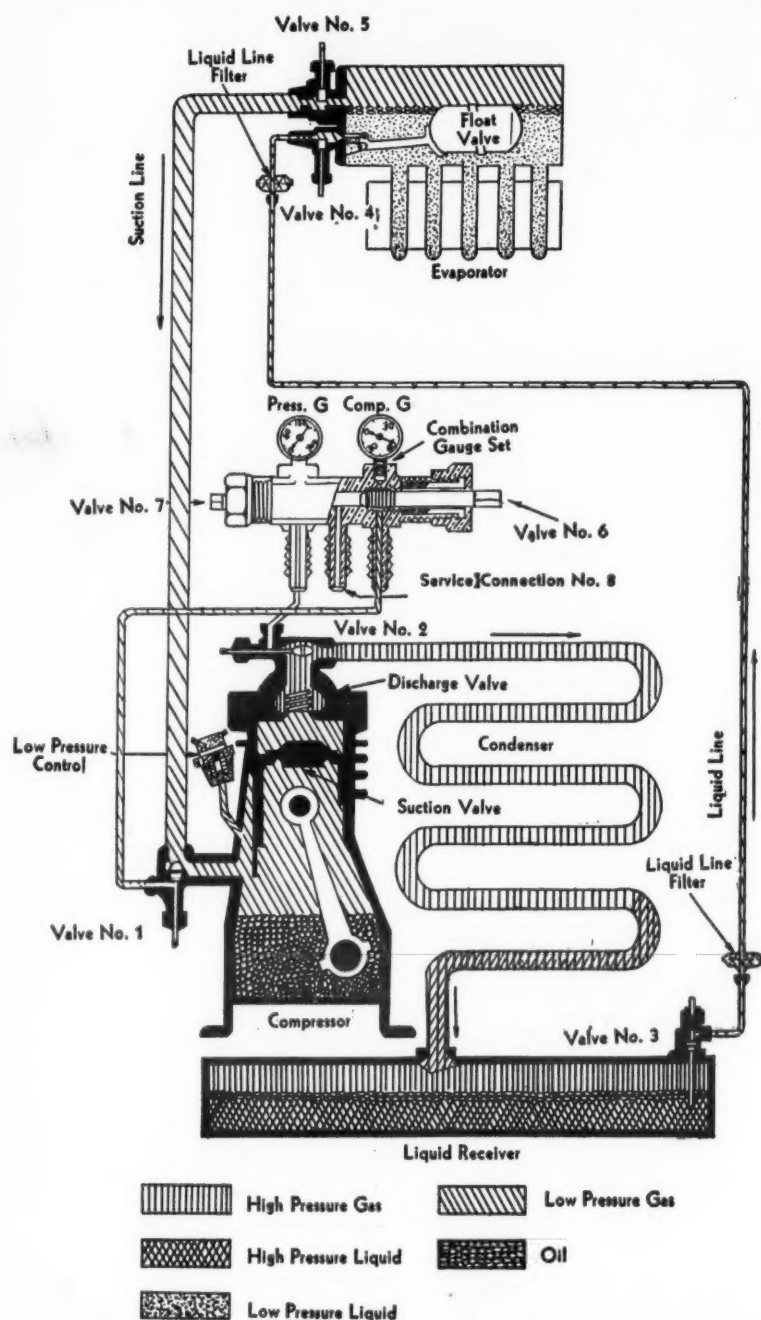


Fig. 1—This system is a typical flooded type with low side float valve refrigerant control. In Manual No. 2, it is classified as a type 1 system. There are four variations of type 1 systems, type 1A, shown above, and type 1B both use low pressure controls but type 1B does not have evaporator shut-off valves. Type 1C and 1D systems use thermostatic controls but type 1D does not have evaporator shut-off valves.

Flooded System with High Side Float Valve

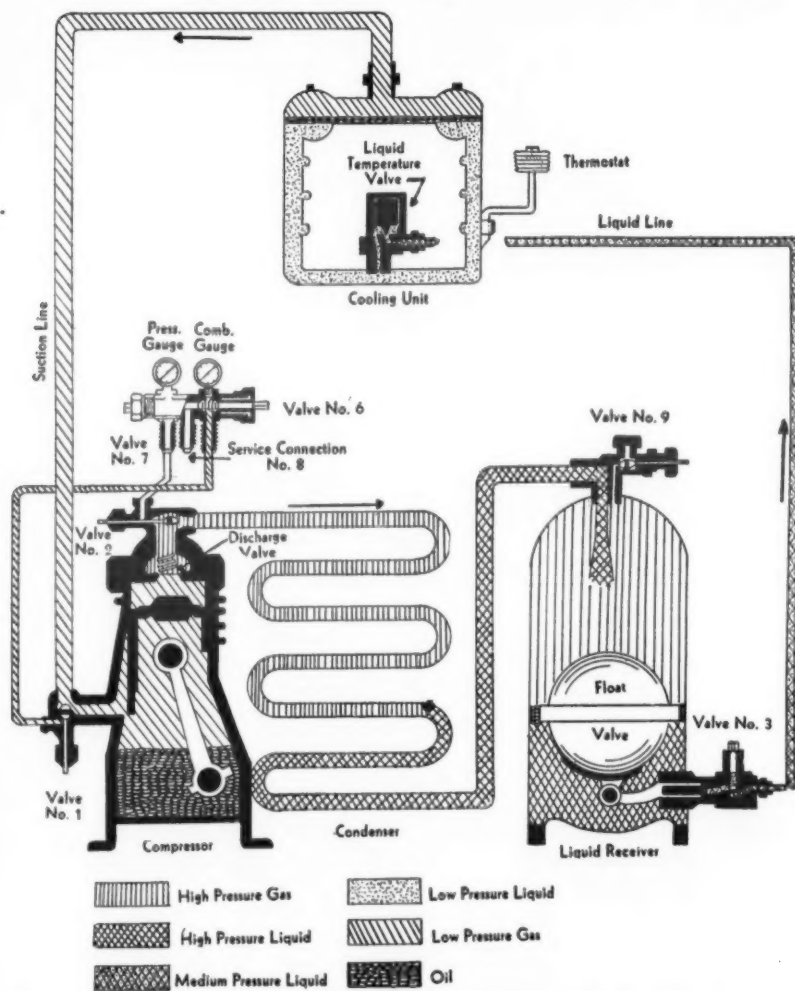


Fig. 2—This is a flooded system equipped with a high side float valve and is classified as a type 2 system. There are two variations of this type of system. Type 2A, shown above, employs a high side float valve in the liquid receiver, a liquid temperature valve on or near the evaporator, and a thermostatic control. Type 2B system differs from 2A in that it employs a high side float valve between the bottom of condenser and the evaporator and a low pressure control in suction line.

Household Systems Are Divided into 4 Classes For Service Directories

Editor's Note: In writing the "Master Service Manuals on Household Refrigeration" one of the most important steps that author K. M. Newcum took was to explain that there are a few fundamental types of household refrigeration systems, which can be regarded as having almost identical problems from a service standpoint. Mr. Newcum then described these various types of systems, and outlined in detail the service complaints that might be encountered in each type of system, and the methods used in servicing each type.

This information is contained in Chapter 9 of Manual No. 2 of the household refrigeration series. It is pointed out that each conventional system will fall under one of the several classified types, such as low side float valve system (type 1), high side float valve system (type 2), automatic expansion valve system (type 3A), thermostatic expansion valve system (type 3B), and capillary tube system (type 4).

These major types are sub-classified according to the arrangement of service valves and the type of automatic control used.

Published on this and the following pages are the author's explanation and illustrations of the various classifications, just as given in the Manual.

This information is being published for the benefit of new readers of the News who are in the service business, and to provide an example of the type of information to be found in the Manuals.

The large majority of conventional systems employ either the low side float valve, high side float valve, expansion valve, or capillary tube. The systems then will be classified in the order that they come, viz:

- Type 1: Flooded system; low side float valve.
- Type 2: Flooded system; high side float valve.
- Type 3: Dry expansion system; automatic expansion valve.
- Type 4: Capillary tube system.

IDENTIFICATION OF VALVES

Service instructions given in Manual No. 2 are prepared on the basis that systems 1, 2, 3, and 4 incorporate the conventional reciprocating type of compressor employing three standard shut-off service valves located and labeled as follows:

Valve No. 1: Compressor suction line shut-off service valve, located on the intake (suction) port of the compressor.

Valve No. 2: Compressor discharge line shut-off service valve, located on the exhaust (discharge) port of the compressor and connected to the condenser.

Valve No. 3: Receiver liquid line shut-off service valve, located on or near the liquid receiver.

Where the flooded evaporator, using the low side float valve is equipped with shut-off service valves, they will be located and labeled as follows:

Valve No. 4: Evaporator liquid line shut-off service valve, located on the float valve header and serving as a connection for the liquid line.

Valve No. 5: Evaporator suction line shut-off service valve, located on the float valve header, and serving as a connection for the suction line.

FLOODED SYSTEM WITH LOW SIDE FLOAT VALVE

Type 1, flooded systems, using the low side float valve are divided into the following classifications in consideration of service complaints:

Type 1A: Flooded system, using the low side float valve, low pressure control, and having two evaporator service valves, valves No. 4 and No. 5, as shown in Fig. 1.

Type 1B: Flooded system, using the low side float valve, low pressure control, and the evaporator not equipped with shut-off service valves No. 4 and No. 5.

Type 1C: Flooded system, using low side float valve, thermostatic control, and having two evaporator service valves, valves No. 4 and No. 5.

Type 1D: Flooded system, using low side float valve, thermostatic control, and the evaporator not equipped

(Concluded on Page 37, Column 3)

A Complete Course of Study in AIR CONDITIONING

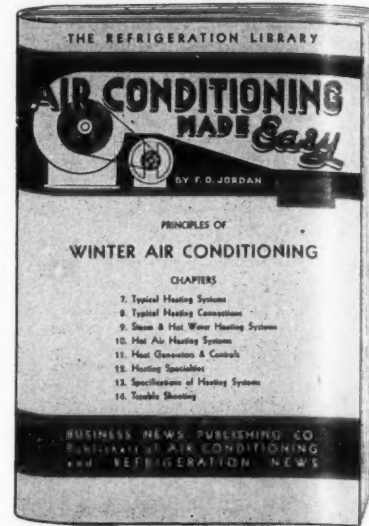
Ideal for trade school instruction or independent home study by service men, engineers and students

By F. O. Jordan, B.S.M.E.

Graduate of Purdue University, Registered Consulting Engineer, Member American Society of Refrigerating Engineers, Chief of Editorial Staff and Director of Laboratory Training of Refrigeration & Air Conditioning Institute



MANUAL NO. A-1—Principles of Summer Air Conditioning. Functions of Air Conditioning. An explanation of typical air-conditioning systems, refrigeration cycles, performance of heat transfer surfaces, condensers, unit performance and summer air-conditioning systems. 112 pages. Price \$1.00.



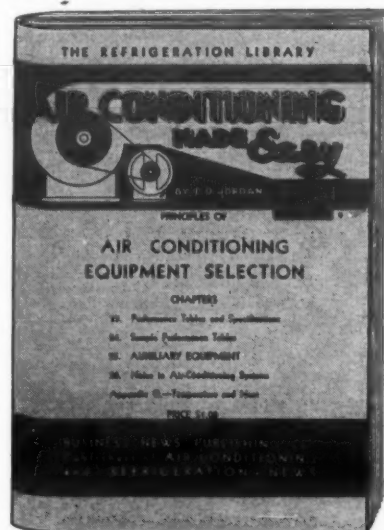
MANUAL NO. A-2—Principles of Winter Air Conditioning. Chapters on typical heating systems, typical heating connections, steam and hot water heating systems, hot air heating systems, heat generators and controls, heating specialties, specifications of heating systems, trouble shooting. 104 pages. Price \$1.00.



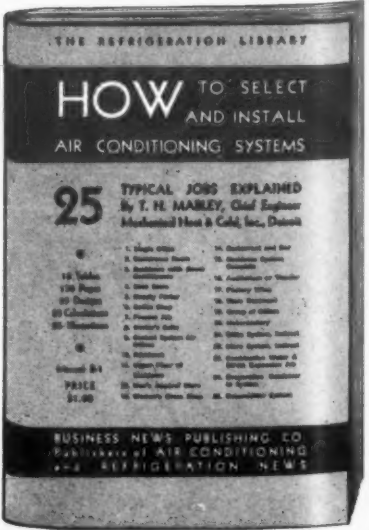
MANUAL NO. A-3—Principles of Design Engineering. Chapters on conditions for human comfort, methods of comfort control, mechanics of comfort control, principles of design, air-conditioning unit design. 112 pages. Price \$1.00.



MANUAL NO. A-4—Principles of equipment development. Methods of developing air-conditioning equipment with numerous performance charts. Description of miscellaneous refrigeration machines. Electrical theory. 112 pages. Price \$1.00.



MANUAL NO. A-5—Principles of air-conditioning equipment selection. Performance tables and specifications, sample performance tables, auxiliary air-conditioning equipment. Noise in air-conditioning systems. 104 pages. Price \$1.00.



MANUAL NO. B-1 By T. H. Mabley—Twenty-five typical air-conditioning jobs explained and estimated. Especially valuable for contractors, dealers, and prospective users who want brief and condensed information. 136 pages. Price \$1.00.

MANUALS NOS. A-6 AND A-7—Two additional manuals in the series by F. O. Jordan will be off the press in November, A-6 on Principles of Estimating Loads and Selecting Equipment (Price \$1.00) and A-7 giving details of estimating loads and selecting equipment for domestic and commercial installations and design of distribution systems (Price \$1.00).

Note: The minimum extra charge for each package of books shipped outside of the U. S. is 50 cents. Up to six \$1.00 books may be shipped in one package.

Business News Publishing Co., 5229 Cass Ave., Detroit

Fig. 3
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Dry Expansion System with Expansion Valve

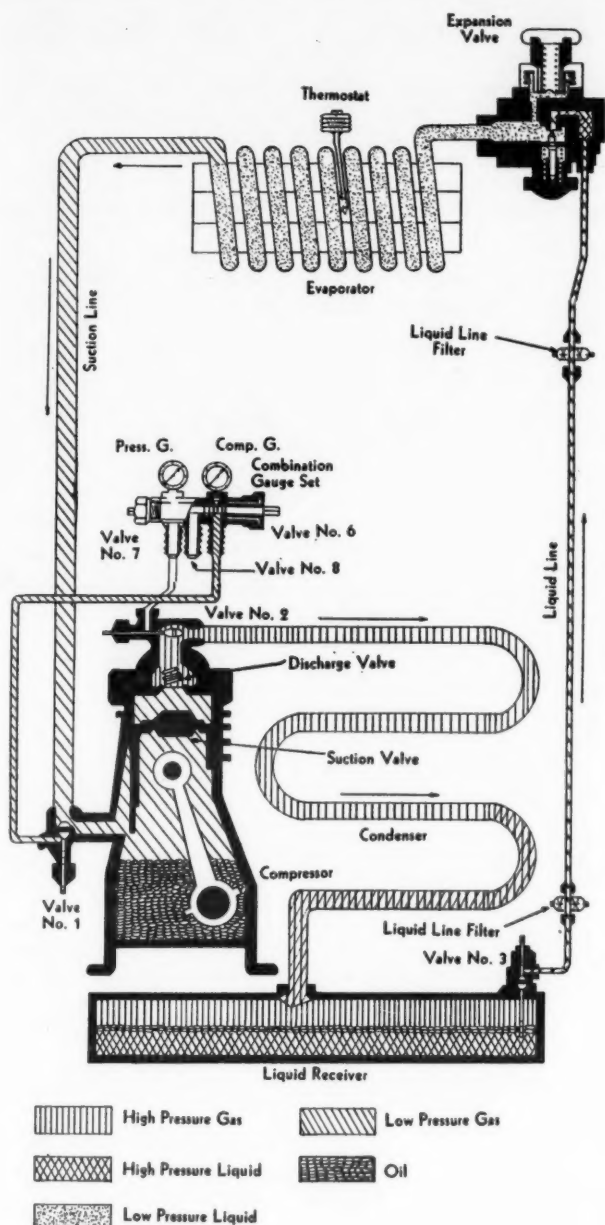


Fig. 3—This is an example of the type 3 system which is a dry expansion system. The illustration is for a type 3A unit which uses an automatic expansion valve as the refrigerant control and a thermostat as the temperature control. The type 3B system uses a thermostatic expansion valve instead of the automatic expansion valve.

Service Manual Gives Instructions on Four Types of Systems

(Concluded from Page 36, Column 3) with shut-off service valves No. 4 and No. 5.

FLOODED SYSTEM WITH HIGH SIDE FLOAT VALVE

Type "2A" flooded systems employ the high side float valve contained in the liquid receiver, the liquid temperature valve on or near the evaporator, and a thermostatic control.

The service valve arrangement is shown in Fig. 2. In addition to valves 1, 2, and 3, the valve located on top of the receiver is included and labeled purging service valve No. 9.

Service complaints and operations are given with the combination gauge set installed and properly connected to valves Nos. 1 and 2, as shown in Fig. 2.

The cycle of operation and the general function of the high side float system is given in Chapter 5, paragraph 65 in Manual No. 1.

TYPE "2B" SYSTEM

Type "2B" flooded system employs the high side float valve between the bottom of the condenser and the evaporator, and a low pressure control installed in the suction line between the evaporator and the compressor.

Valves 1 and 2 are of conventional type. Valve 3 is a compressor type or three-way valve with the liquid connection from the bottom of the condenser connecting to the main front connection of the valve. The liquid line is attached to the opening ahead of the valve stem when back seated. The gauge port or third opening is closed when the valve is back seated and is used for by-pass purposes.

Cycle of operation and the general function of the high side float system is given in Chapter 5, paragraph 65 of Manual No. 1.

DRY EXPANSION SYSTEM

Type "3A" dry expansion system employs the automatic expansion valve as the refrigerant control. The temperature is controlled by a thermostat.

The arrangement of the service valves is the same as in type 1 system, and is shown in Fig. 3.

The cycle of operation and general function of the dry expansion system is given in Chapter 5, starting with paragraph 66 of Manual No. 1.

Type "3B" dry expansion system

Capillary Tube System

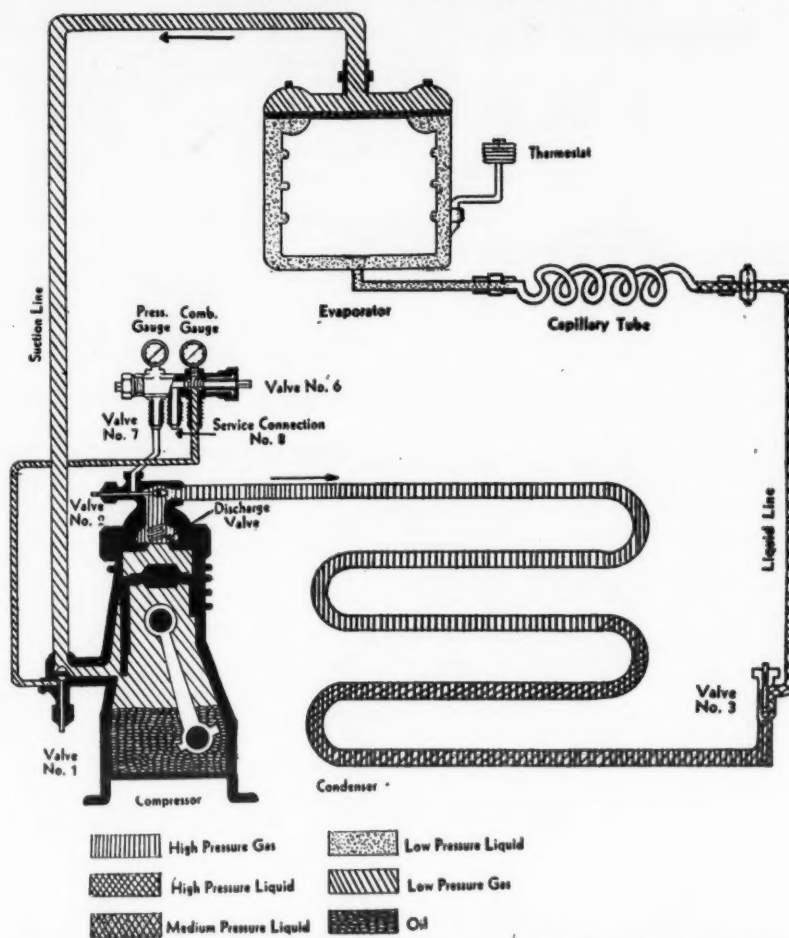


Fig. 4—Type 4A systems are described as being of a conventional type but which use a capillary tube as a liquid throttling device. Temperature control is by a thermostat and the evaporator may be of any type.

employs the thermostatic expansion valve as the refrigerant control. The temperature is controlled by a thermostat.

The arrangement of service valves is the same as type "3A" system and may be noted in Fig. 3.

The cycle of operation and general function of the thermostatic valve and dry expansion system is given in Chapter 5 of Manual No. 1.

CAPILLARY TUBE SYSTEM

The type "4A" system is one comprising a conventional condensing unit either with or without a liquid receiver, but including the three conventional condensing unit service valves. The evaporator may be of any type and the liquid throttling device is the capillary tube. Temperature control is by a thermostat. The evaporator is not equipped with shut-off valves.

The cycle of operation and general function of the capillary tube system are described in Chapter 5, beginning with paragraph 67B of Manual No. 1.

U. S. Gauge Builds Indicating Thermometer for Use in Refrigeration Service

NEW YORK CITY—A new indicating dial thermometer, especially designed for use by refrigeration service men, has been announced by United States Gauge Co. here.

This thermometer, said to be useful also for miscellaneous test work on mechanical refrigerators and for making sales demonstrations, comes enclosed in a case finished in green crackle enamel with a chromium ring. The dial is silver, with figures above 50° F. in red, to indicate unsafe refrigerating temperatures.

Front portion of this case contains the complete mechanism, the bulb, and 5½ feet of capillary tube being wound around a drum in the center.

The bulb is of special design which permits metal-to-metal contact throughout its entire length when clamped to the thermostat bulb of the refrigerator.

Puffer-Hubbard Reopens After Labor Trouble

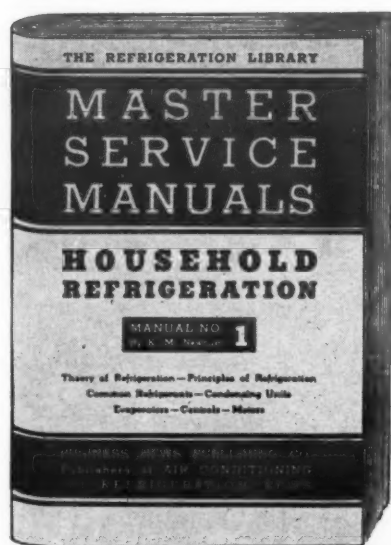
MINNEAPOLIS — Operations of the plant of Puffer-Hubbard Mfg. Co., manufacturer of commercial refrigeration equipment, were resumed Oct. 12, following settlement of labor difficulties which had necessitated a shutdown, reports A. L. Goetzmann, manager.

Richards Seeks New Business For Stewart, James & Co.

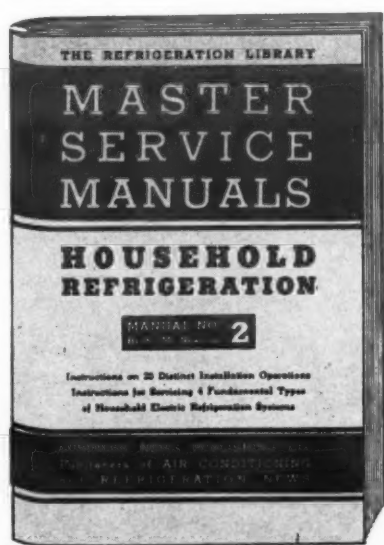
NEW YORK CITY—C. A. Richards, long prominent in export circles as president of C. A. Richards, Inc., has become associated with Stewart, James & Co., Inc. here. He will assist in developing the company's new business.

THE MASTER SERVICE MANUALS GIVE CONCISE INSTRUCTIONS FOR SERVICING HOUSEHOLD ELECTRIC REFRIGERATORS

These books are used to train beginners and for reference by experienced service engineers



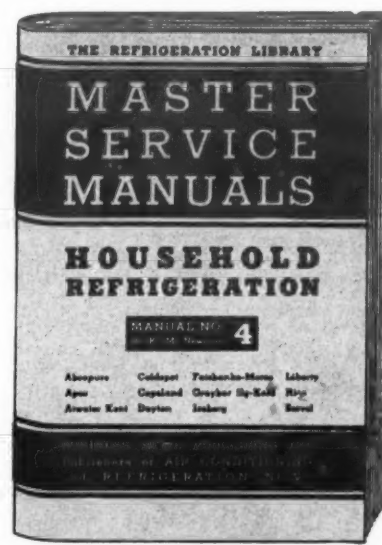
MANUAL NO. 1—Theory and Principles of refrigeration explained in simple terms. Characteristics of various refrigerants in common use. An explanation of the construction and operation of the major component parts of a household refrigerator. 144 pages. Price \$1.00*.



MANUAL NO. 2—Diagrams show how to distinguish the difference between the fundamental types of systems. Detailed instructions regarding the proper methods of installing and servicing each type. A comprehensive guide for all the popular makes. 128 pages. Price \$1.00*.



MANUAL NO. 3—Detailed data on methods of servicing several special types of refrigerators (now classified as "orphan makes") including Allison, Electrice, Holmes, U. S. Hermetic, Majestic Conventional, Majestic Hermetic, Socold, Iroquois, and Welsbach. 144 pages. \$1.00*.



MANUAL NO. 4—Service information on 12 makes of household electric refrigerators including Absopure, Apex, Atwater Kent, Coldspot (Sears and Sunbeam), Copeland, Dayton (Niagara), Fairbanks-Morse, Graybar, Ilg-Kold, Iceberg, Liberty, Rice, and Servel. 136 pages. \$1.00*.

*Note: The minimum extra charge for each package of books shipped outside of the United States is 50 cents. Up to six \$1.00 books may be shipped in one package.

ORDER THESE BOOKS FROM YOUR REFRIGERATION SUPPLY JOBBER OR BUSINESS NEWS PUBLISHING CO., 5229 CASS AVE., DETROIT, MICH.

W. S. Shipley Is Named President of RMA

(Concluded from Page 1, Column 5)
I. Lyle, president of Carrier Corp., was named first vice president.

On the organization's executive committee for the coming year, in addition to Mr. Shipley and Mr. Lyle, will be: D. Norris Benedict, vice president and general manager of Frick Co.; H. A. Feldbush, general manager of Carbondale division of Worthington Pump & Machinery Corp.; J. M. Fernald, general manager of Baker Ice Machine Co., Inc.;

G. A. Heuser, president of Henry Vogt Machine Co.; and Emil Vilter, chairman of Vilter Mfg. Co. William B. Henderson continues as executive vice president.

Carl W. Vollmann, president of the Linde Canadian Refrigeration Co., Ltd., was elected an honorary member of RMA during the annual meeting.

Born and educated in Germany, Mr. Vollmann first came to the United States in the early 1880's.

He went to Canada in 1895 and established the Linde Canadian Refrigeration Co. a year later. Many of the outstanding refrigeration installations of the Dominion are the work of the company he heads.

Refrigerator Rebuilding Service Is Offered In Philadelphia

(Concluded from Page 1, Column 4)
Only saleable merchandise is repaired by the organization; all other units are junked, and the dealer is paid one-half of its value as specified in the trade-in allowance schedule.

Two examples of the plant's reconditioning work were shown to Philadelphia dealers at a meeting at the Electrical Association on Sept. 27, Mr. Asch says.

The local plant has facilities for reconditioning 300 units a week, Mr. Asch says.

In its "memorandum agreement to dealers and distributors," the plant proposes to do specifically the following:

1. Recondition and refinish for dealers and distributors all one-door refrigerators which are reasonably complete and operative for a fixed charge of \$20 per refrigerator.

(This applies to refrigerators up to 10 cu. ft. Two-door units will be reconditioned at a price of \$25. Reconditioning includes replacement or refinishing of hinges, latches, trays, shelves, door gaskets, refinishing interior and exterior of cabinets, as well as repairing and reconditioning of the mechanical unit.)

2. Warrant such reconditioned refrigerators for a period of 90 days from date of "start up"; warrant covering service and parts. This last applies only to units located within the city of Philadelphia.

3. "Start up" the reconditioned refrigerator at the home of the original purchaser thereof; again applying only to installations in the city of Philadelphia.

4. Give dealers or distributors 30 days' notice of any change in its plan.

Dealers and distributors, in turn, agree to abide by the following:

1. Deliver at their expense, the refrigerator to be conditioned to the Associated Refrigerator Plant, preferably via distributor's truck at the time of the original "pick-up."

2. Abide by the plant's decision as to whether the refrigerator is an operative and complete job, and if it is not:

a. Accept from the plant one-half of the refrigerator's "book" trade-in value, or

b. Arrange for a special price covering its reconditioning, or

c. Take back the refrigerator.

3. Call for the refrigerator with check covering reconditioning charges per refrigerator within seven days after notice that it is complete and ready.

4. Offer any surplus merchandise first to dealers or distributor of that brand of merchandise, and then to any other dealer who has an outlet for it. Price on such transactions is to be figured as follows:

a. The established "book" trade-in value on refrigerator.

b. Plus 10% of that price for handling.

c. Plus a charge of \$20 for overhauling.

Dealers and distributors are asked to sign the agreement to indicate to the reconditioning organization that they are aware of the manner in which their transactions with the plant will be handled. It does not obligate the dealer or distributor to do business with the plant. However, the plant will not recondition any merchandise for dealers or distributors who have not executed the memorandum agreement.

All Detroit Firms Join In Jobs Crusade

DETROIT—In what is believed to be the largest adaptation in a metropolitan center of the National Salesmen's Crusade idea undertaken so far, Detroit business and sales executives launched on Oct. 16 a concerted drive to "Sell Detroit Back to Prosperity," with their slogan "Sales Alone Make Jobs."

Refrigeration and electrical appliance dealers and distributors, together with all other elements of Detroit business life, are partners in the drive, which is modeled closely after the "Sales Mean Jobs" campaigns sponsored by Nash-Kelvinator Corp. in various cities earlier in the year.

George W. Mason, Nash-Kelvinator president, is a member of the general committee for the campaign.

Completed plans for the drive were revealed to more than 700 employees of sales forces and their guests at a luncheon last Thursday in the Statler hotel, at which Mayor Reading read a proclamation urging support of all citizens in the movement, and talks were made by James Daly, editor of The Sample Case, official organ of the United Commercial Travelers of America; Circuit Judge Joseph A. Moynihan; and C. C. Carleton, president of Motor Wheel Co., Lansing, Mich.

Reporting on the success of a similar campaign in Lansing last July and August, Mr. Carleton said that business men had shown a general increase of 24% in the period of July 15 to Aug. 15, a time considered the slowest of the year from a retail standpoint.

He likened the campaign movement to the mighty religious revival begun in the Crusades of old, in that the present drive calls for the same elements of zeal, zest, and enthusiasm as did the medieval crusades.

"It is this frame of mind on the part of salesmen that will carry the crusade to success, and return thousands of men to work," he said. "The recession reached its lowest point in June, and we are now on the way out."

"Confidence is being restored, and hoarding is being turned into investment and purchasing power. There is nothing to do now but to awaken to the opportunity for increased sales, and to get to work with confidence and enthusiasm."

Mr. Carleton labeled as false the old adage of the pathway being beaten to the mousetrap maker's door.

"No one will come near your mousetrap factory unless you advertise, and so build better and cheaper mousetraps," he declared. "Enthusiastic salesmanship is the prime ingredient of this crusade. People are ready to buy, and will buy, if you go after them."

Speaking from the salesman's viewpoint, Mr. Daly pointed to the fallacy of the belief, prevalent in the depression, that there was a "buyers' strike" and that it was useless to send out salesmen. Business fell off almost in direct proportion to the number of salesmen who were laid off, he said. He also scouted the idea that youth and experience could be found combined in one man.

"There is no chance to go forward except through the medium of profitable enterprise," he said, warning against the temptation to turn the crusade into a giant cut-price sale. "Sell more goods at a profit, and you will give more work to more men," he advised.

"Everything that has made life more comfortable and cultural through the centuries has had to be sold to people. Buyers did not ask for coal, electricity, or even the automobile. They were not only uninterested, but often resentful, of innovation. We even had to sell bathtubs to America."

"Everything we have today is the result of some man's dreams, plus the enterprise and salesmanship of others. Bear in mind that there can be no prosperity without sales, and your job will be made easier. You salesmen are the ones who can build a future for America."

"Salesmen as well as employers have permitted defeatism to permeate every fiber of their being," Judge Moynihan said, "but that time is now past. This crusade will be another of those great civic movements which have carried Detroit in the past along the path to cultural and civic betterment."

Grigsby-Grunow Creditors To Meet Oct. 24

CHICAGO—Creditors of the defunct Grigsby-Grunow Co. will meet at 11 a.m. Oct. 24 in Room 1802, 7 S. Dearborn St., to examine and pass upon the latest report of Trustee Frank M. McKey, and to decide as to the declaration of a third dividend to creditors whose claims have been filed and allowed, announces Wallace Streeter, referee in bankruptcy.

Summary of Trustee McKey's fourteenth report and account shows total receipts of \$3,977,140.40, total disbursements of \$3,080,579.11, and a balance on hand of \$896,566.11.

Applications for allowances to be passed upon at the meeting are:

Frank M. McKey, trustee, statutory fee \$79,822.80
(Less \$31,314.60 previously allowed and paid on account, leaving balance of \$48,508.20)

A. L. Schapiro, attorney for trustee, on account.. 45,000.00
(In addition to \$30,000 heretofore allowed and paid on account)

Russell, Murphy & Pearson, attorneys for petitioning creditors 40,000.00
Costs advanced 69.33

William E. Leahy, special attorney for trustee..... 1,000.00
Rosston & Hort, special attorneys for trustee.... 1,500.00

Electrolux Assembly Line Turning Out '39 Models

EVANSVILLE, Ind.—W. E. Baker, vice president in charge of production for Servel, Inc., reports that the final assembly line for Electrolux household refrigerators at the company's plant here is in operation on 1939 models.

Approximately 3,000 employees are on the payroll, and this number may be increased when sales and advertising plans for new models are released early in November, Baker said.

Anaconda Copper Refrigeration Tubes

Easily bent!



THE AMERICAN BRASS CO.
FRENCH SMALL TUBE BRANCH
General Offices: Waterbury, Conn.

A HEARTY WELCOME Awaits You at HOTEL BARLUM

810 OUTSIDE ROOMS WITH COMBINATION TUB AND SHOWER

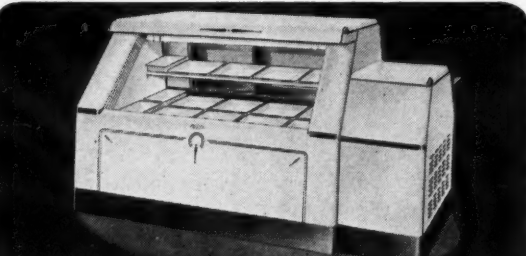
From \$2.00



CADILLAC SQUARE AT BATES ST.
DETROIT

The NEW Percival

NO. 1000



UNITIZED CASE! With Refrigerating Unit!

FACTORY INSTALLED... FACTORY TESTED
READY TO OPERATE ON ARRIVAL

Note these superior features... balanced refrigeration... temperature control... controlled high humidity... genuine porcelain finish... corkboard insulation... abundant storage space... magnetic display... no-sweat front glass... three-way service cabinet with scale stand, wrapping counter and paper roller, and unit housing.

The Percival Unitized Case is built to the high standard of all Percival equipment. Due to its popularity and volume production, it is offered at an extremely attractive price.

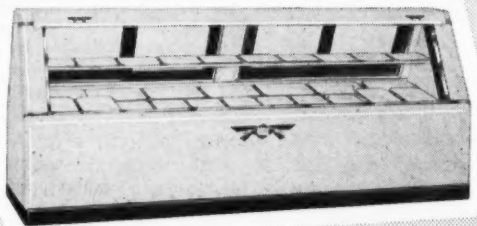
52 Years of Service 1886-1938

C. L. PERCIVAL COMPANY DES MOINES IOWA

DOUBLE PROFITS Selling Sherer's 1938 CASE AND COOLER HEADLINERS

The Sherer Franchise Offers:

- ★ COMPLETE LINE OF CASES, COOLERS AND BOXES.
- ★ NEW EQUIPMENT constantly under development, opening new fields for compressor sales.
- ★ LAYOUT DEPARTMENT—layouts for food store modernization programs without obligation.
- ★ ADVERTISING—Sherer Equipment advertised by mail and in leading trade publications.

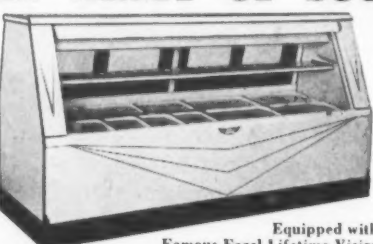


Equipment and Compressor Sales go together. Sell both on one contract.

Write for catalog and franchise details, mentioning territory desired.

SHERER-GILLET CO. MARSHALL MICHIGAN
Manufacturers of Refrigerated Display and Storage Equipment

AN ARMY OF SUCCESSFUL DEALERS!



Equipped with Famous Fogel Lifetime Vision

Dealers in all parts of the world are flying the Fogel colors and marching ahead to bigger victories each year. Their weapon is **SOUND, HONEST Fogel Quality** and their victories are **INCREASED VOLUME and GREATER GOOD WILL.**

Inquire today about our complete line of refrigerated food storage and display equipment.

Interesting distributor proposition to qualified firms.

FOGEL REFRIGERATOR COMPANY, Since 1899
16th & Vine Sts., Phila., Pa.

"Ranco? YES SIR!"

RANCO heavy-duty Commercial Controls are recognized as leaders in the field, because they are simple, accurate and completely dependable.

See your Ranco Jobber—when you need controls for Beverage Coolers, Water Coolers, Ice Cream Cabinets, Display Cases and similar applications.

Ranco Inc., Columbus, Ohio, U.S.A.

RANCO COMMERCIAL CONTROLS

CLASSIFIED ADVERTISING

RATES: Fifty words or less in 6-point light-face type only, one insertion, \$2.00, additional words four cents each. Three consecutive insertions \$5.00, additional words ten cents each.

PAYMENT in advance is required for advertising in this column.

REPLIES to advertisements with Box No. should be addressed to Air Conditioning & Refrigeration News, 5229 Cass Ave., Detroit, Mich.

POSITIONS WANTED

YOUNG MARRIED Man, graduate of Refrigeration & Air Conditioning Institute, now employed at good salary. Eight years on job and can furnish excellent references. Especially interested in commercial refrigeration. Willing to work for less than now receiving if job offers opportunity for experience at service work with good service man as boss. Willing to travel considerable distance for interview if prospect looks good. Write DONALD L. NELSON, Fairmont, Minnesota.

EQUIPMENT FOR SALE

TRAILER FOR SALE. Reo Coupe-Detroit Aero Trailer. Forty-two feet overall. First class running condition. Built for household appliance merchandising. Bargain price. RACKLIFFE BROS. CO., INC., 250 Park Street, New Britain, Conn.

REPAIR SERVICE

DOMESTIC CONTROLS repaired: Ranco pencil \$1.75, Ranco box \$2.00, General Electric \$2.00, Tag \$2.00, Cutler-Hammer \$2.00, Penn \$2.00, Bishop Babcock \$2.50, Majestic \$2.50, Penn magnetic \$2.50, G. E. Frigidaire \$2.50. In business over 20 years. Our name is our guarantee. **UNITED SPEEDOMETER REPAIR CO., INC.**, 436 West 57th Street, New York City.

CONTROL REPAIR service. Your controls repaired by expert mechanics, with

*"Superior by name
Superior in Quality"*

SUPERIOR VALVE & FITTINGS CO.
500-37th ST. PITTSBURGH, PENNA.

Manufacturing a complete line of DIAPHRAGM PACKLESS VALVES, MANIFOLDS, ACCESSORIES and FITTINGS for the Refrigeration and Air Conditioning Industry.

Dayton V-BELTS

Silent, vibrationless, dependable, long-lasting. Powerful grip prevents slippage. A nearby distributor carries a complete stock for appliances and machines.

THE DAYTON RUBBER MFG. CO., DAYTON, OHIO
World's Largest Manufacturer of V-Belts

Compressors

M&E
EST. 1856



MERCHANT & EVANS CO.
Phila., Pa., U.S.A. Plant at Lancaster, Pa.

PARTNERS FOR 12 YEARS

U.E.I. and Refrigeration-Air Conditioning Industry For 12 years U.E.I. has supplied this industry with trained, competent shop mechanics, service and installation men. Our graduates are trained as you want them trained.

Free Placement Bureau U.E.I. trained men are available everywhere. Use our Free Placement Bureau when you need help.

UTILITIES ENGINEERING INSTITUTE
404 N. Wells St. Chicago, Illinois
Established 1927 17 West 60th St. New York, N.Y.

PAR CONDENSING UNITS
28 MODELS
1-4 TO 20 H. P.
WRITE FOR FREE CATALOG

MODERN EQUIPMENT CORP.
DEFIANCE, OHIO, U.S.A.

special precision equipment. Supervised by graduate engineers. We stress perfection and dependability before price. One year guarantee on domestic controls. Any bellows operated device repaired. **HALETRIC LABORATORY**, 1793 Lakeview Road, Cleveland, Ohio.

ATTENTION — GRUNOW Compressors completely rebuilt! Former Grunow factory field engineer—Jack H. Shinberg—in charge of complete rebuilding and service shop under factory authorized supervision. All compressors rebuilt with latest design vanes—vane springs—oil device and unloader. Only \$15.00—nothing additional for burnt stators. **GRUNOW FACTORY AUTHORIZED SERVICE**, 1915 Shattuck Avenue, Berkeley, California.

ELECTRIC MOTOR repairing, armature and stator rewinding on all refrigeration and air conditioning motors, A.C. or D.C. Pick-up and delivery service. All work guaranteed. Motors bought and sold. Burnt out motors bought. Prices on request. **COMMERCIAL MOTOR SERVICE CO.**, 601 West 26th St., New York, N. Y.

GENERAL ELECTRIC and Westinghouse hermetic units rebuilt. Guaranteed unconditionally for one year and returned to you refinished like new. Units are entirely disassembled in our large modern shop, tested through every step of production during rebuilding with the most complete test equipment for accurate work, then subjected to exhaustive running tests under actual operating conditions. Each unit measures to exacting standards after rebuilding. Prices \$30.00 on General Electric DR-1, DR-2, and Westinghouse; \$35.00 on General Electric DR-3. Quotations furnished on other models. Quick service—guaranteed work. **REFRIGERATION MAINTENANCE CORP.**, 321-27 East Grand Avenue, Chicago, Ill.

WORLD'S LARGEST Rebuilders of hermetic units. Specializing in Majestic, G. E., Westinghouse, Grunow, Frigidaire, Kelvinator, Gibson, Crosley, Norge, Spar-ton, Leonard, Coldspot, Stewart-Warner, etc. Dealers exchange price \$30.00 with 18 months' written guarantee. Parts for Grunows and Majestics. G & G GENUINE MAJESTIC REFRIGERATOR AND RADIO PARTS SERVICE, 5801 Dickens, Chicago.

MISCELLANEOUS

TRACINGS REPRODUCED in duplicate, triplicate or multiple copies, photographically on tracing cloth. Guaranteed good as original. Also Blue Line Prints made from tracing reductions. Samples and prices on request. **GRAPHIC ARTS PHOTO SERVICE**, Third and Market Streets, Hamilton, Ohio.

PATENTS

HAVE YOUR patent work done by a specialist. I have had more than 25 years' experience in refrigeration engineering. Prompt searches and reports. Reasonable fees. **H. R. VAN DEVENTER (ASRE)**, Patent Attorney, 342 Madison Avenue, New York City.

QUESTIONS

Seeks Manufacturers Of Bar-Type Shelving

No. 3314 (Dealer, Massachusetts)—"Please send us the names of manufacturers of wire shelving for refrigerators, bar types."

Answer: The following are manufacturers of wire shelving for refrigerators:

Aluminum Goods Mfg. Co. Manitowoc, Wis.
Collis Co., Box 231, Clinton, Iowa
Garden City Plating & Mfg. Co. 1430 S. Talman Ave., Chicago, Ill.
Kason Hardware Co. 127 Wallabout St., Brooklyn, N. Y.
Knappe & Vogt Mfg. Co. Grand Rapids, Mich.
Peerless Wire Goods Co., Inc. Lafayette, Ind.
Union Steel Products Co., Albion, Mich.
United Steel & Wire Co. Battle Creek, Mich.
L. A. Young Spring & Wire Co. 9200 Russell St., Detroit, Mich.

You will find this list and a good deal of other valuable information in the 1938 Refrigeration & Air Conditioning Directory, which sells for 50 cents per copy. Listed in this directory are manufacturers of all types of household and commercial refrigeration and air-conditioning equipment, parts, accessories, supplies, etc.

The information contained in the book is easily accessible, as the arrangement, classification of products, and the selection of names in this directory have been made entirely from the viewpoint of the average buyer in the refrigeration and air-conditioning business.

Sources of Vacuum Pumps

No. 3315 (Manufacturer, Indiana)—"We thought you could assist us in locating sources of supply for vacuum pumps that could be used as auxiliary vacuum pumps in connection with the installation of refrigeration and air-conditioning equipment."

"About a year and a half ago we had advice regarding at least one supplier in the vicinity of New York City but have since lost track of this source."

Answer: The following are manufacturers of vacuum pumps which might be suitable for your purposes: C. A. Dunham Co. 450 E. Ohio St., Chicago, Ill.
Worthington Pump & Machinery Corp. E. Harrison, N. J.
Buffalo Foundry & Machine Co. 43 Winchester Ave., Buffalo, N. Y.
General Electric Co., Schenectady, N. Y.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Chicago Pneumatic Tool Co. E. 44th St. & Sherman Ave., Chicago, Ill.

Makers of Birdseye Frosted Foods Cases

No. 3316 (Advertising Agency, Chicago)—"We desire names of manufacturers of Birdseye's cases."

Answer: These cases are manufactured under a contract, which has about one more year to run, by the Frosted Food Cabinet Division of the American Radiator Co., 40 W. 40th St., New York City.

While American Radiator Co. manufactures the vast majority of these cabinets, some other display case manufacturers have made a few jobs which are used by Birdseye distributors who may prefer them.

Who Makes 'Kenmore' Condensing Units?

No. 3317 (Reader, New York)—"I would like to obtain any information which you may have concerning a condensing unit manufactured under the name of 'Kenmore.'"

"A friend of mine in Brazil, S. A., writes and requests this information and so far I have been unsuccessful in obtaining it for him."

"He states that this unit is being introduced in that country and believes it is of American make."

Answer: There is a company known as the Kenmore Machine Products, Inc., formerly at 1200 Niagara St., Buffalo, N. Y., which has recently moved to Lyons, N. Y.

We do not believe, however, that they make condensing units, but are manufacturers of high side floats and oil separators.

Booklet on Servicing Ammonia Machines

No. 3318 (Service Man, California)—"Will you please tell me how I may receive a booklet or material on the repairing and maintenance of small ammonia commercial plants. Do any of your service manuals cover ammonia refrigeration?"

Answer: We think that the book which you want is our Refrigeration Engineer's Manual, which is devoted chiefly to ammonia refrigeration systems.

This book explains all about the operation of ammonia systems of various types and also gives information on service operations for compressors, describing details which are common and essential to all plants.

The Master Commercial Refrigeration Service Manuals Nos. 1 and 2, which give information on the servicing of commercial refrigeration systems, sell for \$1.00 each.

Extra Copies of Locker Storage Issues

No. 3319 (Service Man, Indiana)—"Books arrived in swell shape, also the three extra you sent along. I am sending money order to cover the cost of them. As I have purchased so many of your books I think you should send me the issues of the News that contain information on cold storage locker plants."

Answer: We are pleased to know that your manuals arrived in good shape. We also wish to thank you for your remittance of \$3.50 for the three Commercial Manuals.

The price of these manuals is \$3.00 (\$1.00 each). We are therefore, sending you some issues of the News which contain information on Locker Storage Plants for the extra 50 cents.

Issues containing most information on locker storage are the June 8 issue, which was a "special" on locker storages, the June 29, and July 27 issues.

Handling Fountains

No. 3320 (Engineer, W. Virginia)—"I am the engineer at the Parkersburg Post Office and I have two electric drinking fountains to service. I have been informed that you have a book on electric drinking fountains. If you have a book of this kind, and will mail it to me C.O.D., I will appreciate it very much. I think the name of the book is the Master Service Manual."

Answer: We publish a Master Service Manual Series on refrigeration. Since the refrigerating units that are

used in water coolers are similar to those used in household refrigeration, we believe that the books which you will want are the Master Service Manuals on Household Refrigeration.

There are four books in this series but we believe that you will need only Manuals Nos. 1 and 2. Manual No. 1 deals with the principles of refrigeration; Manual No. 2 gives refrigeration installation and service methods.

These books sell for \$1.00 each.

H. W. Dexter, Formerly With Oil-O-Matic, Dies

STAMFORD, Conn.—Howard W. Dexter, for the past four years general sales manager of Petroleum Heat & Power Co. here, died of

pneumonia Sept. 30 in Greenwich hospital, Greenwich, Conn.

Mr. Dexter was born in Chicago in 1895. After leaving high school, he began his business career in the field of advertising, serving first as space representative for several business publications, and later as account executive with leading Chicago advertising firms.

New England Sales Manager For Westinghouse Dies

WELLESLEY, Mass.—James P. Alexander, New England sales manager for Westinghouse since 1927, died Oct. 8 at his home here. He was 53 years old. He joined the Westinghouse organization in 1907.

THE BUYER'S GUIDE

WELDED STEEL

THE KOCH LINE IS Complete
Walk-In Coolers, Commercial Refrigerators and all types of Display Cases

Koch does not manufacture or sell condensing units. Koch distributors therefore furnish the units they sell.

Write Today for Information on PROFIT POSSIBILITIES

KOCH REFRIGERATORS
NORTH KANSAS CITY, MO.



REFRIGERATION PRODUCTS

COILS
CONTINUOUS, HEAVY ALUMINUM FINS, .024" THICK — ACCELERATING CONDUCTION AND CONVECTION. APPROVED .035" WALL TUBING. SILVER SOLDERED JOINTS.

HUMI-TEMPS
FORCED AIR COOLING WITH HUMIDITY AND TEMPERATURE CONTROL. IMBEDDED FIN-TO-TUBE CONTACT. STAGGERED TUBING.

Write for Literature or See Your Local Jobber

LARKIN COILS, INC.
General Office and Factory
519 FAIR STREET, S. E., ATLANTA, GA.
NEW YORK FACTORY, 102 FIFTH AVE.






A tight system calls for
FITTINGS THAT WILL STAY TIGHT

IMPERIAL S. A. E. flared fittings have been setting a mighty fast pace in the air conditioning and refrigeration field . . . and their rapid acceptance by installation and service men is based on results. Imperial fittings are tight when the job is finished and they stay tight.

Write for catalog covering complete listing of sizes and prices.

IMPERIAL BRASS MFG. CO., 365 S. Racine Ave., Chicago

IMPERIAL Fittings ORDER FROM YOUR JOBBER

VALVES • TOOLS • CHARGING LINES • FLOATS • DEHYDRATORS • STRAINERS




Modern Refrigeration Shafts

For reliable, accurate, time-tested service, Shafts by "MODERN" are regarded as leaders in the refrigeration and air conditioning industry. Send us your blueprints and specifications for estimates on your Shaft requirements.

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